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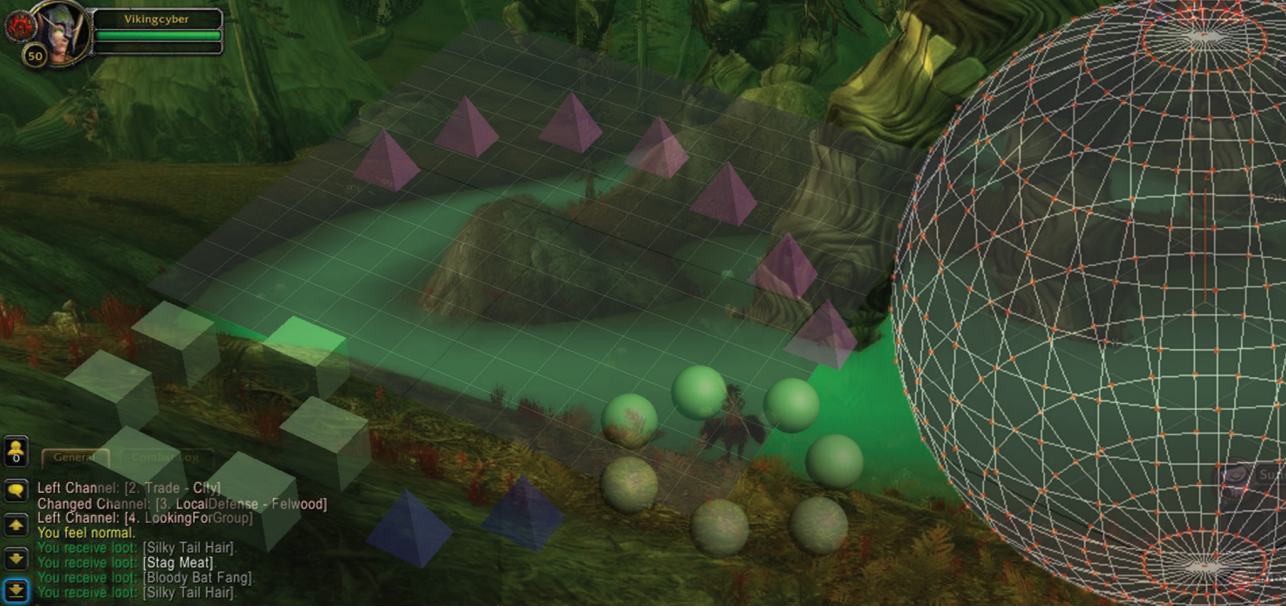

THE ROLE OF VISUAL GRAMMAR AND PLAYER PERCEPTION IN AN ONLINE GAME

BY
BANPHOT NOBAEW

DISSERTATION SUBMITTED 2015

AALBORG UNIVERSITY
DENMARK

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AALBORG UNIVERSITY
DENMARK

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CV

My background was Mass Communication and Media Art and Design. I did several digital short films about Thailand s' art and culture incorporating with digital tools. I did a number of researches by applying multimedia technologies to other disciplines such as landslide simulation to predict the risk area and setting warning system, and integrating a digital tool to enhance learning in secondary and high school. I have taugh in School of Information Technology, Department of Multimedia Technology and Animation in Mae Fah Luang University, Thailand since 2006.

ENGLISH SUMMARY

A person who speaks a foreign language by stringing words together or who employs the vocabulary of the foreign language with the grammar of his first language has a hard time communicating. Communication is possible, but will be severely hampered and some ideas may not be possible to express at all. This is my first hand experience from moving to Denmark to study for my PhD degree. In Thailand, I speak Thai, my mother tongue as well as English when I teach design to multimedia students at university level. These students will go on to design games, websites, animation, graphic design, etc. I realize that my students will have to deal with games and research literature in English, and they will experience the same difficulties communicating their ideas as I have experienced myself. Hence, I decided to embark on a quest for a third level of communication: neither English, nor Thai, in fact, not a verbal language at all, but rather a visual language. However, I quickly realized that this was a challenging approach beyond my present capacity as a researcher; therefore, I instead decided to explore the possibility of formulating a visual grammar for the design of digital games as a foundation for communicating design ideas among students who are designing digital games. Instead of the usual verbal language grammar which presents a set of rules that explains how words are used, my goal is to present a set of rules that explains how elements of visual imagery and interactive instruments can be used in a visual game design.

What I present is a prototypical idea, not yet the proof of a concept, since I have not been able to test out the grammar in actual teaching situations. Still, I want to present my work as a PhD thesis, because, going through the research literature of game design I have not found any better stepping stone towards my goal which is a high level of communicating game play ideas that is not depending on any verbal language.

My quest for a grammar to communicate ideas for the design of digital games has followed a sequence beginning with trying them out myself, with all the bias and blindness that goes with subjective experience. This includes the obvious limitation of having only played one game, WoW. I have tried to balance this bias in two ways: by interviewing game design practitioners, and by studying the research literature on digital game design. The field of digital visual design is in its infancy and I believe that my research will assist both my students and students generally. One important way in which this research will help my students is to enable them to consider the users of digital technologies and not only from the designers' point of view. This, I propose, is the key point in my approach.

So, my research investigates the relationship between players of an online digital game and the imagery of the game. I have worked out the grammar based on the

assumption that there are rules which govern visual composition such that they contain meanings; these rules have many similarities to the grammar of a language, and they also correspond to various art and literary theories.

What do I hope to achieve with my research in the long term? My hope is that this work will help my students to produce games that are easily understood by the players. If I manage to accomplish a proof of concept, revised prototype and an actual test, the prospects would be encouraging. A visual grammar of digital game design can then be applied equally to medicine, education, training, business, edutainment, etc. Applying visual grammar in these areas will increase their effectiveness. Presently, 3D online games are at the forefront of visual design, hence they are an appropriate starting point for this research. Digital applications in medicine, education, etc. have concentrated on making information available digitally with little consideration for presentation. If these applications can be designed within a framework of visual grammar, they will hold students' attention and encourage them to continue in this field of endeavour.

At present, the visual design of digital games is driven by game designers who tend to build upon art and film theory. My approach is to understand how gameplayers react to, and interact with the results of the design of digital games. My prototypical visual grammar is constructed from the reactions and interactions of gameplayers. Clearly, there is an advantage in using a commercial game as games must attract and retain players for the long term. World of Warcraft is the ultimate in this commercial respect.

Playing myself, and consulting with practitioners of the game design yielded the following results which are summarized in the table below:

- to understand the game fully
- to experiment with analytical frameworks derived from art theory, semiotic and literature - visual theories
- to establish a tentative theoretical and analytical framework
- to repeat the above steps using the same data from my own gameplay until a practical analytical framework had evolved

Step No.	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
1	Initial research into WoW	To understand the ethos and practice of WoW		Literature search: academic and anecdotal (i.e. players' comments) – online, journals and books	Classify and store for future reference
2	Personal gameplay	To understand WoW and its environment	Myself	Participate in WoW online for 2 years and record and analyse games; immersion in the ethos of the game; make notes about the game	Digital record of gameplay; notes on aspects of the game. Data classified as a) game objects and visual elements (b) quests and tasks in game (c) meanings of game objects (d) interactions (e) rules and mechanics – and stored for future reference
3	Interview game designers; observe game production – not WoW	To understand how: designers develop concepts and story; game development process from concept to details	Game designers from educational institutions	(a) interviews with designers: questionnaires, notes and sound recordings (b) production process: video recordings and photographs	Prepared and stored for future reference
4	Tentative framing of a Visual Grammar for Online Games	To commence process of framing a Visual Grammar for Online Games		Constructing a Visual Grammar for Online Games and analytical tools from extent visual theories; data collected in steps 1 to 3; and personal	

Step No.	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
				experience	
5	Visual analysis of WoW to test Visual Grammar for Online Games framed in step 4	To try a tentative version of a Visual Grammar for Online Games		Apply theoretical and practical frameworks developed in step 4 to data collected in steps 1 to 3; Analyse results to extract unsatisfactory components; analyse and modify unsatisfactory components.	
6	Adjusting theoretical and analytical frameworks from experience gained in step 4	To modify and test the Visual Grammar for Online Games to produce a final version which performs well both theoretically and practically		Modify theoretical and practical frameworks and repeat steps 4 and 5; alternative versions can be retested simultaneously; further gameplay also employed to enable test different versions	Repetition of steps 4 and 5 in the context of modified theoretical and practical frameworks
7	A working version of a Visual Grammar for Online Games	To formulate an initial working version of a Visual Grammar for Online Games		Assemble all satisfactory components to compile a provisional version	

Step No.	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
8a	Field testing of the working version of a Visual Grammar for Online Game	To further develop a Visual Grammar for Online Game	15 players playing WoW in groups	Game workshop; observation of gameplayers during play	Simultaneous software recording of gameplay and video recording of players playing WoW; retained for analysis in step 8b
8b				Open-question interviews with gameplayers whilst watching and analyzing their own gameplay	Video recordings of interviews
9	Analyse data from steps 7, 8a and 8b in the context of visual grammar formulated in step 7	To revise the working version of the Visual Grammar for Online Game		Data from step 7, 8a and 8b used to revise the working version of the Visual Grammar for Online Game in the light of observation of and interviews with players, and the players own analysis of the games they had played	
10	Verify that theoretical and analytical frameworks are satisfactory	To verify that all data has been interpreted accurately and ensure that no mistakes have occurred		Verification and confirmation of lack of errors in all stages of the research to date; re-analyse data from workshop in context of any changes to theoretical and analytical frameworks from step 9	

Step No.	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
11	Formulate a definitive Visual Grammar for WoW	A Visual Grammar for one game as a representative of all online digital games. This to serve as a benchmark for future research in this field with possible applications in education, training, medicine, etc.		A final revision and checking of all details and research to date	

There are three types of data collection: visual elements in the game; gameplay from my personal online gameplay; and in the game workshop.

(3) I interviewed game designers in Denmark. Although they are not the designers of World of Warcraft, it is not feasible to gain access to those individuals. The objective here was to understand the design processes work and how they develop the concept into a finished product. I made adjustments to the tentative analytical framework in the light of knowledge gained and suggestions from the designers. Some of the designers had played World of Warcraft and were able to make useful suggestions.

(4) - (7) I produced a tentative visual grammar for digital games which was developed from my tentative analytical framework. I formulated procedures for observing gameplay and collecting information to provide the data required for the analytical framework. I made adjustments to ensure that the analytical framework would provide the type and the form of data required to test my tentative visual grammar theory. I continued to play World of Warcraft to try out specifics and modify theory and practice in order to produce the best possible working versions.

(8) I field tested my procedures at a game workshop in Thailand. Fifteen gameplayers in one room played World of Warcraft independently. Their gameplay was recorded by software. The players' reactions including exclamations, verbal comments and facial expressions were simultaneously recorded on video.

Gameplay and reactions were matched up and shown to players during the subsequent interviews during which they analysed their own gameplay and discussed their reactions.

(9) The data from the game workshop was applied to the tentative analytical framework with the specific purpose of searching for problems in the application of the visual grammar and making adjustments and reapplying the data until a final working version of the analytical framework was established. Thus the data was analyzed and used to produce a working version of a Visual Grammar for Online Game.

(10) I applied the Visual Grammar for Online Game to all of the accumulated data including what was acquired from the game workshop and my own gameplay. This was in order to test whether the tenets of the Grammar held true. I made further adjustments where necessary.

(11) A final version of my Visual Grammar was then produced with the intention that it can be used as a benchmark in future research in addition to other applications, not only in digital games, but in other digital visual media.

The results of my research, the analytical framework and Visual Grammar for online Digital Games are strictly speaking applicable only to digital games, and only one game at that: World of Warcraft. I am certain that it can be adapted to a wide variety of applications, however, this would have been beyond the scope and scale of this present research. My intention is that these efforts will form a starting point. I propose that this analytical process can be readily applied to other media.

I should like to conduct further research myself into applications in other fields, particularly education. My research has focused upon an analysis of a single entity – World of Warcraft – which already exists. An interesting question would be: "What would happen if one produced a game or other program using the Visual Grammar as a tool?" While it would not be a substitute for ideas, imagination and originality, it might help to express a variety of ideas and also retain students' attention and interest, especially in fields like education, business and medicine.

DANSK RESUME

En person som taler et fremmed sprog ved at sætte ord sammen til sætninger uden hensyn til grammatik eller ved at anvende det fremmede sprog med sit modersmåls grammatik har det svært ved at kommunikere. Kommunikation er dog mulig, men nogle gange kan det være svært at udtrykke ideer og tanker som man vil det. Min egen førstehåndsoplevelse fra mit ophold i Danmark i forbindelse med min p.hd. vidner om sådan en oplevelse. I Thailand taler jeg modersmålet og jeg taler engelsk når jeg underviser i design til studerende på multimedieuddannelsen på universitetet. Når de studerende er færdige på universitet, så skal de på jobmarkedet, hvor de skal designe spil, websites, animationer og grafisk designs, og de kommer til at erfarer mine oplevelser fra mit ophold i Denmark. Jeg har derfor besluttet at tage på en ny rejse på et tredjeordens niveau af kommunikation. Det drejer sig hverken om Engelsk eller Thai – faktisk ikke et verbalt sprog – men et visuelt sprog. Jeg fandt hurtigt ud af at denne opgave var udfordrende for mig som forsker, og jeg besluttede mig for at udforske muligheden for at udforme en visuel grammatik som grundlag for at designe digitale spil. Denne visuelle grammatik skal fungere som et værktøj for studerende som designer digitale spil. I modsætning til den sædvanlige brug af sprog som ressource for opsætning af regler for udviklingen af spil, så forsøger jeg at bruge det visuelle som kommunikationsform for min visuelle grammatik. Derfor er mit overordnede mål med afhandlingen at præsentere hvordan visuelle elementer og interaktive instrumenter kan bruges i spildesign.

Det, jeg præsentere i min afhandling, er, en prototypisk ide eftersom jeg endnu ikke har haft mulighed for at afprøve den visuelle grammatik i undervisningssituationer. Til trods for dette, så præsenterer jeg stadig mit arbejde som en ph.d.-afhandling, da jeg fra mit litteratur review har erfaret, at mit mål om at udarbejde en visuel grammatik for spildesign er efterspurgt.

Mit mål om at kommunikere et forslag til en visuel grammatik har fulgt en sekventiel opbygning, hvor jeg selv har afprøvet mine ideer først – om end sådan en subjektiv oplevelse rummer en form for blindhed. Dette indebærer, at jeg kun har spillet et spil, World of Warcraft (WoW). Jeg har forsøgt at afbalancere min bias og blindhed på to måder: ved at interviewe spiludviklere og ved at studere litteratur om digital spildesign. Forskningsfeltet om digital visuel design er i børnestadiet, og jeg er af den overbevisning, at min forskning kan støtte mine studerende og studerende i andre land og uddannelsessammenhænge. I den forbindelse kan jeg pege på et centralt bidrag i min forskning, nemlig at min visuelle grammatik vil hjælpe studerende med at forstå brugere af digitale teknologier og ikke kun fra designerens perspektiv.

Med andre ord undersøger jeg forholdet mellem spillere af online spil og den visuelle opbygning af spillet. Jeg har udarbejdet en visuel grammatik baseret på en antagelse om, at der visse regler som styre den visuelle komposition og dermed bibringer mening til oplevelsen af spillet. Disse regler deler mange træk med sprogets grammatik, og der også ligheder til forskellige kunst og litterær teorier.

Så, hvad er det, jeg håber på at opnå med min forskning i et længere perspektiv? Mit håb er, at mit arbejde vil hjælpe studerende med at producere spil som spillerne nemmere kan forstå. Hvis jeg lykkedes med at validere mit koncept, producere revideret prototype og en egentlig test, så er potentialerne opfordrende. En visuel grammatik af spildesign kan efterfølgende appliceres til felter som medicin, uddannelse, forretning og edutainment. Efter bedste overbevisning tror jeg, at en visuel grammatik vil øge disse områders effektivitet. På nuværende tidspunkt er 3D spil på forkant med visuelt design og er derfor et passende udgangspunkt for forskningen i visuel grammatik. Digitale applikationer indenfor medicin, uddannelse, etc. har primært fokuseret på at gøre information tilgængelig uden at stillingtagen til visuel præsentation. Hvis disse applikationer kan designes med udgangspunkt i en visuel grammatik, så vil det styrke de studerendes opmærksomhed og opfordre dem til at fortsætte deres uddannelse.

På nuværende tidspunkt er visuelt design af digitale spil drevet af spildesignere, som for det mest bygger på kunst og film teori. Min tilgang er rettet mod at forstå hvordan spillere forholder sig til og interagere med resultaterne af designet af de digitale spil. Min prototypiske visuelle grammatik er konstrueret ud fra spillernes reaktionerne og interaktioner med spillene. Der er helt klart en fordel ved at studere et kommercielt spil, da det skal designes så spillerne fastholdes over længere tid. World of Warcraft er det ultimative eksempel på dette.

Jeg spiller selv WoW, og gennem konsultation med praktikere af spildesignet har jeg fundet frem til følgende resultater, som er opsummeret i tabellen herunder:

- At forstå spillet fyldestgørende
- At eksperimentere med analytiske rammeværk baseret på kunst, semiotik og litteratur teori – visuelle teorier
- At etablere et foreløbigt teoretiske og analytiske rammeværk
- At gentage ovenstående fase ved at bruge samme data fra mit eget min egen spilerfaring indtil et analytisk rammeværk tog form

Fase Nr.	**Forskningsfaser**	**Feltarbejde i praksis**			
		Mål	**Deltager**	**Metoder, aktiviteter og materialer**	**Data og analyse**
1	Forundersøgelse af WoW	At forstå etos og praksis omkring WoW		Litteratursøgning: akademisk (tidsskrifter og bøger) og personlige beretninger (online)	Klassificering og arkivering til fremtidigt arbejde.

Fase Nr.	Forskningsfaser	Feltarbejde i praksis			
		Mål	**Deltager**	**Metoder, aktiviteter og materialer**	**Data og analyse**
2	Egen erfaringsdannelse	At forstå WoW og miljøet	Forskeren	Deltagelse i WoW gennem 2 år – optagelse og analyse af spillet. Indlevelse i spillets forsvar og noter om spillet.	Digital optegnelse af spillet; noter om aspekter af spillet. Data klassificeret som a) spil objekter og visuelle elementer (b) opgaver og mål i spillet (c) spil objekternes meninger (d) interaktioner (e) regler og mekaniker – alt sammen lagret til fremtidigt brug.
3	Interview spildesignere; observere spilproduktion - ikke WoW	For at forstå hvordan: designere udvikler koncepter og historier; spiludviklingens proces fra idé til detaljer	Spil designere fra uddannelsesinstitutioner	a) Interviews med designere: spørgeskemaer, noter og lydoptagelser (b) fremstillingsprocessen: videooptagelser og fotografier	Fremstillet til fremtidig brug
4	Foreløbig udformning af den Visuelle Grammatik for online spil	At påbegynde processen med at udarbejde den Visuelle Grammatik for online spil		Konstruktion af den Visuelle Grammatik for online spil og analyseredskaber fra udvidede visuelle teorier; data indsamlet i fase 1 til 3; og personlig oplevelser	
5	Visuel analyse af WoW for at teste min Visuelle Grammatik for online spil som præsenteret i fase 4	Afprøvning af den foreløbig version af den Visuelle Grammatik for online spil		Anvendelse af teoretiske og praktiske rammer, der er udviklet i fase 4 til data indsamlet i fase 1 til 3; Analysere resultater til at udtrække utilfredsstillende komponenter; analysere og modificere utilfredsstillende komponenter.	
6	Justering af den teoretiske og analytiske ramme baseret på erfaringerne fra fase 4	At ændre og teste den Visuelle Grammatik for online spil ved at udarbejde en endelige version, som fungerer godt både teoretisk og praktisk		Ændre teoretiske og praktiske rammer og gentage fase 4 og 5; alternative versioner kan testes igen samtidigt; yderligere spil også anvendt til at gøre det muligt at teste forskellige versioner	Gentagelse af fase 4 og 5 i forbindelse med modificerede teoretiske og praktiske rammer
7	En arbejdsversion af den Visuelle Grammatik for online spil	At formulere en indledende arbejdsversion af den Visuelle Grammatik for online spil		Opsamling af alle tilfredsstillende komponenter til at udarbejdelse en foreløbig udgave	

Fase Nr.	Forskningsfaser	Feltarbejde i praksis			
		Mål	**Deltager**	**Metoder, aktiviteter og materialer**	**Data og analyse**
8a	Test af fungerende version af den Visuelle Grammatik for online spil i praksis	Yderlig udvikling af den Visuelle Grammatik for online spil	15 WoW spiller som spiller i grupper	Spil workshop; observation af spillere	Registrering af spillet og videooptagelse af spillere, der spiller WoW; tilbageholdes til analyse i fase 8b
8b				Interviews med spillere mens de spiller og analyserer deres egen spil forløb	Videooptagelser af interviews
9	Analyser af data fra fase 7, 8a og 8b i forbindelse med den visuelle grammatik formuleret i fase 7	At revidere den etablerede version af den Visuelle Grammatik for online spil		Data fra fase 7, 8a og 8b anvendes til at revidere den fungerende version af den Visuelle Grammatik for Online Game i lyset af observation af spillere og interviews med spillere, og spillernes egne analyser af de spil, de har spillet	
10	Verificering af om teoretiske og analytiske rammer er tilfredsstillende	At verificere at alle data er blevet fortolket korrekt og sikre, at ingen fejl er opstået		Verifikation og bekræftelse af manglende fejl i alle faser af forskningen til dato; re-analysere data fra workshop i forbindelse med eventuelle ændringer teoretiske og analytiske rammer fra fase 9	
11	Formulere en endelig version af den Visuelle Grammatik for WoW	En visuel grammatik for et spil som repræsentant for alle online digitale spil. Dette kan tjene som et benchmark for den fremtidige forskning på dette område med mulige anvendelser inden for uddannelse, medicin, osv		En endelig revision og kontrol af alle detaljer og forskning til dato	

Der er tre typer af dataindsamling: visuelle elementer i spillet; min egn personlige online erfaring med online spil; og i spillet workshoppen.

(3) Jeg interviewede spildesignere i Danmark. Selv om de ikke er designerne af World of Warcraft, er det ikke muligt at få adgang til disse individer. Formålet her var at forstå designers arbejdsproces, og hvordan de udvikler konceptet til et færdigt produkt. Jeg foretog justeringer af de foreløbige analytiske rammer i lyset af den opnåede viden og forslag fra designerne. Nogle af designerne havde spillet World of Warcraft og var i stand til at komme med nyttige forslag.

(4) - (7) Jeg producerede en foreløbig visuel grammatik for digitale spil, der blev udviklet fra mine foreløbige analytiske rammer. Jeg formulerede procedurer for at observere online spil og at indsamle oplysninger til at give de nødvendige oplysninger til den analytiske ramme. Jeg foretaget justeringer for at sikre, at den analytiske ramme ville give den type og form af data, der kræves for at teste min foreløbige visuelle grammatik teori. Jeg fortsatte med at spille World of Warcraft

for at afprøve detaljerne og ændre teori og praksis for at producere de bedst mulige arbejdsvilkår versioner.

(8) I testede mine procedurer på en spil workshop i Thailand. Femten spillere sad i ét rum spillede World of Warcraft selvstændigt. Deres spil blev optaget af software. Spillernes reaktioner inklusive udråb, verbale kommentarer og ansigtsudtryk blev samtidig optaget på video. Spillet og reaktionerne blev matchet op og vist til spillere i løbet af de efterfølgende interviews hvor de analyserede deres eget spilforløb og diskuteret deres reaktioner.

(9) Data fra spil workshoppene blev anvendt på den foreløbige analytiske ramme med det specifikke formål at søge efter problemer i forbindelse med anvendelsen af den visuelle grammatik. Herefter foretages justeringer og genanvendes data, før en endelig fungerende version af den analytiske ramme blev fastlagt. Data blev således analyseret og anvendt til at fremstille en fungerende version af en Visuelle Grammatik for online spil.

(10) Jeg har anvendt den Visuelle Grammatik for online spil til alle de akkumulerede data, herunder hvad der blev erhvervet fra spillet workshoppen og mine egne spilforløb. Dette var for at teste, om de læresætninger i Grammatikken holdt sandt. Jeg lavede dertil yderligere justeringer om nødvendigt.

(11) En endelig version af min Visuelle Grammatik blev derefter fremstillet med den hensigt, at det kan bruges som benchmark i fremtidig forskning i tillæg til andre programmer, ikke kun i digitale spil, men i andre digitale visuelle medier.

Resultaterne af min forskning, de analytiske rammer og den Visuelle Grammatik til online digitale spil, gælder strengt taget kun for digitale spil, og kun et spil: World of Warcraft. Jeg er sikker på, at det kan tilpasses til en bred vifte af applikationer, men det ville have været uden for rammerne og omfanget af nærværende forskning. Min intention er, at disse bestræbelser vil danne et udgangspunkt. Jeg foreslår, at denne analytiske proces let kan anvendes på andre medier.

Personligt vil jeg gerne foretage yderligere undersøgelser af anvendelsesmuligheder på andre områder, især uddannelse. Min forskning har fokuseret på en analyse af en enkelt enhed - World of Warcraft - som allerede eksisterer. Et interessant spørgsmål ville være: "Hvad ville der ske, hvis man producerede et spil eller et andet program ved hjælp af min Visuelle Grammatik som værktøj?" Selvom det ikke ville være en erstatning for idéer, fantasi og originalitet, kan det hjælpe til at udtrykke en række forskellige ideer og også fastholde elevernes opmærksomhed og interesse, især på områder som uddannelse, erhvervsliv og medicin.

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF PLATES

LISTS OF TABLES

Table 7-1 The integrated Visual Grammar Framework

CHAPTER 1. INTRODUCTION

This dissertation studies the relationship between game content and visual design and player experience in one three-dimensional online game. This study focuses on the role of visual grammar in relation to player perception in one of these games; the methods developed may lead to the study of other games in this genre or the genre itself. The title of my dissertation – 'The Role of Visual Grammar and Player Perception in an Online 3D Game' incorporates the phrase 'visual grammar"; *grammar*, here, is a metaphor. What is grammar? The Oxford English Dictionary defines *grammar* as:

> *The whole system and structure of language or of languages in general, usually taken as consisting of syntax and morphology (including inflections) and sometimes also phonology and semantics.*

This game, and games generally, are constructed from two elements: content – the story, characters, the premises and rules of the game; grammar – the visual systems which bind and control content.

In this study, 'games' refers to digital games; this usually means 'having fun' but it is anticipated that there will be applications in education, medicine, training, creative arts, design, business, etc. These games are a new digital medium which affects people in various ways, for example learning for children, socializing with people in other parts of the world by integrating play, space and virtual worlds. Digital games now attract players of both genders and of all ages from children to their grandparents creating steady growth in the game market. According to data from a global market research company, the video game industry was valued at $25 billion in 2010 (Anderson & Raine, 2012), increasing to $63.4 billion in 2012 (www.theesa.com/facts/index.asp). The Entertainment Software Association's report '2012 – Essential Facts about the Computer and Video Game Industry'

compiled with data from more than two thousand households in the United States reported that:

> *'(a) Parents also see several benefits of entertainment software, with 52 percent saying video games are a positive part of their child's life. Sixty-six percent of parents believe that game play provides mental stimulation or education, 61 percent believe games encourage their family to spend to time together, and 59 percent believe that game play helps their children connect with their friends.*
>
> *(b) Ninety percent of the time parents are present when games are purchased or rented. Ninety-eight percent of parents feel the Entertainment Software Rating Board rating system is helpful in choosing games for their children. Seventy-three percent of parents believe that the parental controls available in all new video game consoles are useful.*
>
> *(c) The average gamer is 30 years old and has been playing for 12 years. Sixty-eight percent of gamers are 18 years of age or older.*
>
> *(d) Forty-seven percent of all players are women, and women over 18 years of age are one of the industry's fastest growing demographics.*
>
> *(e)Today, adult women represent a greater* ***portion [sic]*** *of the game-playing population (30 percent) than boys age* ***[sic]*** *17 or younger (18 percent).*
>
> *(f) Sixty-two percent of gamers play games with others, either in-***(?)** *person or online. Seventy-eight percent of these gamers play with others* ***(for)*** *at least one hour per week. Thirty-three percent of gamers play social games. Gamers play* ***on-the-go****: 33 percent play games on their smartphones, and 25 percent play on their handheld device' (Entertainment Software Association (ESA), 2012.)*

Further, the report shows that role-playing games were second-placed in market share for games sold in 2011. Japan and the USA are the biggest markets in the computer game industry. New technology and devices, with their interaction and displays, have enabled and attracted families to play socially. Examples of the devices are PS3, Wii and Xbox 360. This annual research shows that parents are becoming more amenable to these games and more willing to allow them to be played in their homes. For parents, games are a media of entertainment alongside television. There are differing genres of digital games but we shall focus only on

online games. On a single day there may be as many as five million online players but the average is about 3.5 million (http://store.steampowered.com/stats/). These figures show the current extent of the market; games are available everywhere and will eventually reach everyone.

Since the first video game, 'Tennis for Two' in 1958, games have been developing continuously. Development had brought about changes in devices, display format and quality, and players' demographics, but most of all in game aesthetics (see chapter 2). The development of game aesthetics has been facilitated by improvements in imaging, evolving from simple to complex forms, enabling visually realistic and three-dimensional representation. Visual representation is the product of visual properties such as resolution, image quality, dimension, rendering (colour and shading), composition, etc.

Development and evolution in the game world are only one of the factors which prompted me to conduct this research. I have a background in Media Arts and Design from my Master's degree, dealing mostly with visual media and human perception. I had the opportunity to create a small game for children during my Interactive Media course using Macromedia Flash software. The objective of the game is that the player has to choose appropriate foods to feed animals and obtain a score within a thirty-second time limit. The problematic issue for me is how to design games which are both visually attractive and fun to play; and how to use programming to ensure that games run smoothly. I learnt that the most important factor in getting a player's attention is the aesthetics of the game, i.e. visual design; by comparison, playing for a reward is minor. The next step in developing my interest was the opportunity to play two offline computer games: 'Diablo' and 'Age of Empires'; even though I did not like to spend a lot of time sitting and playing, these games had me hooked until the end. I recognise now that visual design rather than the rewards and challenges of destroying armies or slaying monsters were, for me, the primary attraction. The best way to win games of strategy is by trial and error. Playing World of Warcraft for scores or killing monsters was not the initial attraction for me but developed from enjoyment of the game's aesthetics.

Video games have the potential to influence participants. New questions can be raised as to how digital media encourage people to play. What is the power of the visual elements in video games? Do these new media have their own language? Can we understand it? If we understand the language of visual games can we apply it to other applications? If we are to study the language of video games, what kind of theoretical framework will we require? These questions have inspired me to conduct a serious study of World of Warcraft as a synecdoche for all such games. The aim of my research is to provide student game designers with a heuristic approach to visual grammar to create a visual language. Players are not a passive audience; they can assume a character which for Pearce, in 'Games as Art: The Aesthetics of Play (2006)' means that they are co-creators in imaginative gameplay: this is the sense in which I have taken a heuristic approach. The investigation was conducted by interviewing players after they had played the game. This research is an exploratory study of the linguistics of gameplay and its application in real gameplaying.

1.1 Research Questions

To conclude the research question, we need to reconsider online games; what are they, how are they useful and how do they influence players?

Gameplayers often produce new storylines, new props, objects and costumes. Games can cause problems; for example games can be criticised for enforcing gender stereotypes or exposing children to violence or may lead to addiction; some players may gamble with others whilst playing online. More positively, it can be argued that games are good for learning and can teach skills or literacy. Some games may teach young people by presenting them with, and solving, real-life problems; for example, Galvane, a North Carolina man saves passengers' lives by applying his medical knowledge and skills in the America's Army game (forum.americasarmy.com). Many educators using WoW to apply in class-room such as learning language skill and educational tools (article from www.medienkombinat-berlin.de, sites.dartmouth.edu, www.livescience.com). This

game is also used in business training (bigthink.com/videos/how-world-of-warcraft-could-save-your-business-and-the-economy-2). In this study, I focus on the visual perceptions and the visual experiences of the players rather than on derived benefits. We need to know more about how games operate to achieve their objectives. How does the player make sense of visual objects and gameplay? How are the meanings of visual objects produced and consumed?

All of these issues lead to the main research question: what is the grammar of three-dimensional online multiplayer roleplaying games and how do they create players visual perceptions?' These questions lead to three sub-questions:

- How do the visual elements of game design encapsulate meaning and how are the meanings transferred to players?
- How do players perceive and conceive visual elements of design and interpret them visually through gameplay?
- What is the visual grammar of gameplay?

These research questions focus on game images and players; two units of research with different perspectives are required.

1.2 What is visual grammar?

'Visual grammar' is defined by several scholars, such as Buckingham (2010) and Fernande Saint-Martin (1990) as 'a system where basic elements are interrelated according to certain laws or regularities'; Horn (1998) states: 'It is based on the tight investigation of words and visual elements.' I define visual grammar as 'the principles and rules of a visual game landscape (the game territory and environment) for composing the forms of visual elements and structuring the meaning of perceptual experience. It creates the system of visual communication in a particular context'.

Analysis of visual grammar is necessary to conduct research within the visual language within the medium. An online game is it the most suitable medium for an

effective case study of digital visual production because it includes techniques derived from all media such as film, painting, sound design, etc. Diverse media converge in digital games so that play culture, media perception and space and time change the role of player to co-creator (Sanders and Stappers 2008); borders between creator and participants are blurred. People from different places and time zones play in the same virtual space. This research focuses on game discourse analysis: how players participate and interact with design elements within the game's particular landscape. Players are crucial; gameplay requires them to interpret games' design and meanings through their own experience of social structures. This research also acknowledges the role of designers through the complex systems and encoding of meanings in its objects.

1.3 Empirical Coverage

This research focuses on the role of visual grammar in one massively played, multiplayer online roleplaying game (MMORPG): World of Warcraft. The units of research concentrate on three area of study; these units relate to the concept of site modalities proposed by Gillian and Rose (2001). The units relate to game images, internet gameplay sites and players (to be described in more detail in chapter 2). The research draws on two primary data sources; they are my own gameplay and other players' gameplay. Gameplay data, in both virtual and physical space, were recorded on software and video. A focus group interview was carried out in the game workshop.

1.4 Why World of Warcraft (WoW) was used in this research

WoW is a three-dimensional online game in which various stories are mixed in each game. The stories and visual design draw on mythology, ancient history, science fiction, eastern cultures and literary works such as Lord of the Rings. Players of WoW come from different backgrounds and cultures, class, race, socioeconomic groups and so on. Another important factor in choosing WoW is its success at the top of the market for many years. Research confirms that millions of players have

been playing it for nearly a decade (Y-T Lee, Chen, Cheng &n Lei, 2001); the main attraction for players is its visual design (Zimmerman 2007; Song & J Lee 2007; Nardi 2010:86). My first observation of and interviews with players strongly indicated that visual design was the primary motivation to start playing WoW; it is visually beautiful and players enjoy the game landscape. Nardi argues that playing WoW is an aesthetic experience. Game designers, and Nardi in her research, talk about 'gestalt', meaning that the whole is more than the sum of its parts. It is the gestalt of the game design which creates the visual aesthetic experience. The gestalt of the game design can be deconstructed to reveal its original components and how they connect and interact. Nardi (2010) suggests an artifact (or game) can be analysed, in terms of its functions and composition, like a text; the activity (gameplay), in which the artifact is present, can, thus, be examined. (Nardi employs 'artifact' in a meaning close to its origin: 'early 19th century: from Latin *arte* 'by or using art' + *factum* 'something made' (neuter past participle of *facere* 'make') (dictionary.reference.com); therefore, an artifact, or game, is something made by art.

1.5 Analytical Framework

This study investigates visual elements as a semiotic domain, represented by signs, in one online game. The study excludes technical programming. It does not generalize for any other games since other games and game genres have different natures and characteristics.

Player perception is another element of this study. Player Perception is what players experience during gameplay. Gameplay generally refers to an interaction between player and visual elements. Meanings are made during gameplay.

Theoretical frameworks formulated from studies of other media are of limited use particularly for analysis of the third dimension (z axis) of the visual environment; they do not clarify the interconnection between the visual environment and player perception.

Multimodal analysis seems to go further than other frameworks by providing more tools in various modes of gameplay; however, multimodal analysis is too broad, extensive and shallow for analysis of design elements and their effectiveness in online 3D games. Visual semiotics and perception can be used to analyse the visual environment but they ignore player/game interaction.

Because of the complexity of sign systems, more specific and precise tools will be required; additionally, to interpret online games, they will have to be fully integrated.

I have, therefore, taken two approaches which combine methods from different disciplines. Firstly, the visual approach is employed to analyse game images through art theory and visual semiotics. Secondly, multimodal discourse analysis including social semiotics and modalities is used to study game players as co-producers through interaction or gameplay. The research collects and analyses system of signs in World of Warcraft – MMORPG – in terms of design elements and meaning-creating messages. This study is empirical; I carried out the first field research by interviewing game designers and gameplayers in Denmark and organising a game workshop and field research in Thailand. Simultaneous online research was carried out by myself participating in and analyzing the game. It is anticipated that the research will contribute to game design and meanings in games, i.e. digital literacy.

The end result of this study will be to propose a fundamental visual grammar for analyzing three-dimensional online games. This theoretical framework can be used as a tool to investigate all online games and other interactive media. All media are moving inexorably towards virtual representation: for example, entertainment, education, medical simulation, art, industrial and business training, etc. Visual technologies simulate reality through visual perception. Online games are the new mixed medium bridging a convergence culture (Jenkins, 200; Dwyer, 2010).

1.6 Structure of the Dissertation

This dissertation has four main sections. The sections are: theoretical discussion; theory of visual grammar in online games; players' perspectives and experiences; and the relationship between visual grammar and player perception. I have divided this work into seven chapters. The first two chapters are introductory; research commences in the third chapter.

Chapters:

Chapter 1

Chapter 1 is the introduction and deals with the background of the research: research questions, definition of 'Visual grammar, empirical coverage, reasons for selecting 'World of Warcraft' and structure of the dissertation.

Chapter 2

Chapter 2 establishes the theoretical research background and evolution of game aesthetics. It provides taxonomies and components – attributes to define game genres and qualities – to classify what is meant by a 'game'. It will be useful to employ components to study the unit of investigation: the 'site of game images', the 'site of interaction' and the 'site of the player'.

Chapter 3

Chapter 3 lays down the parameters of the research landscape including research approaches, units of study, philosophy of 'World of Warcraft' and data collection and analysis. The conceptual framework of research approaches will be established and applied to investigate the units of research: game, interaction and players.

Chapter 4

Chapter 4 consists of a literature review examining the theoretical foundations required to construct the analytical framework. There are two main parts to the theory. The first is theory required to analyse visual design of games through visual semiotics and art theory and including the Principle of Visual Perception, Gestalt theory, and semiotics of visual language; these theories will be integrated in chapter 5 to analyse data and construct the Visual grammar of Three-Dimensional online Games. The second part relates to theories for analysis of gameplay and interaction and the perceptual experience of players. To analyse player perceptions and experience, it is necessary to combine theories including social semiotics and systemic functional grammar; the combined theories will be used to analyse gameplay data and construct the analytical framework in chapter 6. Gameplay or

interaction requires a different approach; multimodal discourse analysis is employed to investigate gameplay or interaction, in the second part, including speech, music and sound, movement, and gestures.

Chapter 5

Chapter 5 will answer the main research question, focusing on game images. It presents the conceptual framework of visual grammar in World of Warcraft, constructed from the primary data. The conceptual process starts by continuing the approaches in chapter 4 (the first theoretical part) to construct the two main components of visual grammar: Visual Elements and Principles of Visual Elements. The two main principles are the main components of Visual Grammar, a grammar of game language. The two components are connected: visual elements are organised by the visual principles and visual rules. Visual Grammar represents the two components in their entirety; they govern the visual game environment. Each component has its own properties derived from the visual data. The first component is the fundamental visual elements including properties: Line, Shape, Form, Colour, Space and Dimension, Texture and Sound. The second component, visual principles consists of five distinct properties: Balance, Emphasis, Movement, Dynamics and Perspectives.

Chapter 6

Chapter 6 examines the site of the player by interpreting player experience through gameplay or interaction. It will search for relationships between modes of game elements and player perception, or how players make meanings from game elements, which is one of the main questions of this research. A 'methodological framework' to analyse gameplay will be constructed; it will be used to further develop the visual grammar and analytical framework from chapter 5. This chapter starts by reviewing existing approaches (the second part of the theory in chapter 4), which are widely used in other fields, and applying them to analysis of gameplay data. To start, all approaches are integrated and combined to construct the 'methodological framework'. Later, the methodological framework will be used to analyse gameplay and establish the interconnections between modes of game elements and player perception. A methodological framework will be developed for cyclical modal analysis in which each stage connects to the next; most notably, analytical results from one stage are components of the next. The cycle of modal analysis contains five stages:

1. Conceptualisation – the nature and characteristics of the game
2. Categorisation and Quantification
3. Analysis of Gameplay to define Interaction
4. Game Literacy
5. Interconnection between Modes

Chapter 7

This chapter describes the integration of the modes of the virtual world and the real world. It reveals interconnections between objects in the two worlds to contribute to the visual grammar. Data analysis provides more supporting arguments for how visual grammar forms meanings in the virtual landscape and how those meanings shape player perception. This chapter summarises and discusses the research in the context of research questions; it suggests possibilities for further research.

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CHAPTER 2. STATE OF THE ART – RESEARCH AND GAMES

Since their first generation in the 1970s, computer games have developed from entertainment into many other applications. They can be used for education, training, medicine, business, edutainment, advertising, etc. These applications create new game genres; as a result, many scholars have been attracted to applying them in their research fields. Multidisciplinary approaches have been applied to investigate games from the players' perspectives and for scholarly research. Disciplines for study of games include psychology, anthropology, sociology, philosophy, media studies, mass communication, education, computer science, art and literature; and *ludology* which focuses on game and play activities. Mäyrä defines 'games studies' as 'a multidisciplinary disciplinary field of study and learning with games and related phenomena as its subject matter' (2008:6). Games Studies can be divided into several research areas such as game culture, game design, game literacy, games used in business, etc. This study deals with visual presentation and player experience. It seeks to answer the question 'What is the relationship between visual grammar and player perception?'

Several sub-questions need to be addressed. These are: 'What are the game's components?'; 'What is the relationship between the game's components and visual aesthetics?' and 'What is the relationship between visual aesthetics and visual language in the game? A definition of 'visual aesthetics' is required for this study; 'visual aesthetics', generally, refers to an emotional sense of beauty or pleasing appearance (Noam, 2013). A definition of 'visual aesthetics' is required for this study.

These questions set the parameters and methodology for each unit of research for field study; these will be discussed in chapters 4, 5 and 6 within the theoretical framework.

This chapter is divided into two parts: fundamental characteristics of games and research into game landscapes. Firstly, 'What are games?' Then, game components and taxonomies are investigated to establish their characteristics and properties. I propose to reclassify components of the game because current taxonomies are unsuited to the study of newer games including WoW; subsequently, the focus will narrow to the visual aesthetic component.

Research into the evolution of the aesthetics of digital games generally from their origins to the latest products will enable and enhance understanding of WoW's aesthetics. Evolution here will be restricted to how technical visual properties have

enabled and advanced game aesthetics: a sequence of change, not a chronology. Player perceptions at a particular time are governed by how far visual aesthetics has evolved. Visual aesthetics dominates all other considerations in attracting new players through their first impressions, but combinse with the game's other features to persuade them to continue playing. WoW is a good example of this process; having been attracted by its visual aesthetics, players immerse themselves in the game's virtual environment as created by all its components. Gameplay enables players to interact with game objects to gain experience; gameplay also places a player at a location in the game. It is reasonable, as an analytical starting point, to employ established theoretical frameworks from other media for research (chapters 4 and 5).

In the second part of this chapter, I shall study visual aesthetics to establish and codify a visual grammar for digital games, but leading ultimately to a specific visual grammar for WoW. Two different analytical methods will be employed. The primary method is multimodal discourse analysis, divided into three sites as proposed by Rose (2001) adapted to the context of digital games; the three sites are (i) the game's visual elements (ii) players (iii) gameplay or interaction of players and visual elements. The secondary method is semiotic analysis composed of social semiotics, visual semiotics and art theory. These two methods will be developed in the following chapters.

2.1What are games?

2.1.1 Games as an emergent cultural form

Gaming is an emergent visual culture. 'Emergent' (adjective), with 'emergence' (noun,) describes not only a new culture but encompasses player behavior, game properties and interaction between physical and virtual spaces.

Many scholars define gaming culture by using different criteria depending on their perspectives and approaches. Shaw (2010) suggests that there are three distinctive categories of game culture as a framework for diverse viewpoints; the categories are: (i) who plays? (ii) playing practices (iii) kinds of play. Gameplayers create their own communities online and physically. Gameplaying communities are dynamic; members share the same gaming interests. Most online gaming communities seek group contact, share game information and sometimes trade off game objects. In role playing games, such as WoW, players come from many different backgrounds: gender, occupation and social class (Nardi 2011). A search of online media revealed that there are more than eight million websites and blogs devoted to the game (statistic obtained from Searching on Google on 2/10/2013). Players create their own stories to share with team members. Some players even become game designers.

Jesper Juul (2002) describes emergence in terms of developments in game properties and design; for Juul, these developments are the drivers for changing players' experiences and shaping behaviour. He divides emergence into three distinctions: (i) rule interaction: the combining of rules which create variation in events (ii) combination of game properties (iii) strategies: due to more varied experiences and unexpected occurrences, players need to take a more fluid and flexible approach to problem solving. Sweetser divides the emergence of games into local and global.

> *'Emergent gameplay is made possible by defining simple, global rules; behavior; and properties for game objects and their interaction in the game world and with the player. Emergent gameplay occurs when interactions between objects in the game world or the player's actions result in a second order of consequence that was not planned, or perhaps even predicted, by the game developers, yet the game behaves in a rational and acceptable way. Emergent gameplay allows the game world to be more interactive and reactive, creating a wider range of possibilities for actions, strategies, and gameplay (Sweetser 2008:16).'*

For Sweetser, local emergence occurs when a small number of players play independently; in the online environment local emergence does not mean the players are located in a limited geographical area, but rather that they remain isolated from all other players within their own network. Sweetser's global emergence occurs when these local networks link creating a vast, new and always changing network. Each local network has its own unique collective behavior with its own characteristics. Global emergence is a recent phenomenon made possible by advances in technology; local networks link up to create global networks. She separates the emergence of games from local to global into three levels: (i) First order: local interactions (ii) Second order: players formulate strategies and solve problems (iii) Third order: global emergence with gameplaying on a global scale. Sweetser focuses on player behavior rather than the developments which have enabled the changes in their behavior.

The focus of this study differs from both Juul and Sweetser in examining games as an emergent visual cultural form. The study will emphasise on visual composition which is created by visual rules; and interpretation when players interact with game objects. Players play, learn and gain experience from visual interaction through the game storyline. This study is concerned with players' gameplay stories and how they are constructed through visual interaction rather than rules of the game and the scale of interaction.

Development of digital games is expensive and a return on investment is required. As already discussed in chapter 1 (Nadi 2010), visual aesthetics is the overriding factor in creating initial enjoyment to persuade players to start playing. The starting point in visual aesthetics is illusion; Darley discusses illusion in computer games:

> *'the ever greater levels of realism in the imagery and interactivity of computer games, the new heights of seamless visual illusion achieved in the presentations of special venues and the cinema - all tell us that we are being tricked, that what we are seeing and experiencing is, fabrication, an illusion. Being tricked is the whole point. Significant does not run very deep here: for the most part the plots (if they exist all) are extremely basic, involved meaning non-existent (Darley 2000:55).*'

Darley is partially right: cinema and computer games are, technically, visual illusions; he was right about computer games at the time of writing but games have changed and it is not possible to agree with him about games now. In the cinema, audiences are passive in the sense that they cannot influence the plot; in contrast, computer games allow players to create dynamic plots by controlling their Avatars; plots are modified by interaction with other players and non-player characters; there are still limitations – players are still restricted by rules and choices created by designers and programmers.

Players learn the rules of the game in the virtual world. Their missions lead them through a fantasy land where they slay monsters and collect and trade objects, learn skills and accumulate scores. They experience emotions whilst participating with NPCs (Non-player Characters). Like films, digital games also have genres and players have their own preferences: Sport, Adventure, Simulation, Strategy, Puzzle, Role-Play, Management and uncategorized (for new games). The process of managing and regulating gameplay is known as 'segmentation'. 'Segments' are production and marketing oriented whereas 'genre' is consumer centred; there is a rough correspondence between 'genre' and 'segment' (Zagal et al. 2008). Games are created from distinctive signs such as images, moving images, sound, and written texts. These signs form a system which, even in one object, is complex. In my opinion, objects in the virtual world either imitate reality or are the product of imagination. Players interpret meanings from objects, either as part of a symbolic system with which they are familiar (experience), or they may derive meanings from context. Players may also attribute new meanings to objects which may be shared with other players. Game objects are composed of complex elements created from basic art forms; meanings are made from complex elements. Basic art forms are governed by visual language; this concept is important for the future of the game industry. There are many studies of visual language. Rau-Chaplin and Smedley examine exclusively how special-purpose visual language generates architectural forms. Tutenel et al. (2008) examine exclusively the role of semantics in games and simulations. Visual elements in game objects are composed of basic art forms. Therefore, visual forms need to be investigated to understand visual language in games.

2.1.2 Game Components and Taxonomies

There are many kinds of game on the market. Games are categorized by genre to be designed for, and to target, a segment of the market. Taxonomies have been proposed to classify games by genre. Chris Crawford (2003) proposes 'the taxonomy of creative expressions' to classify games and other media such as art, film, toys and puzzles; his taxonomy categorises games by 'terms' (or criteria): entertainment, playthings (interactive), challenges (competitive) and conflict. Crawford (1984:25) further suggests categorization of computer games as either:

- 'emphasising perpetual and motor skills' – skill-and-action games; or
- 'emphasizing cognative effort' – strategy games

Huizinga, a Dutch historian who wrote 'Homo Ludens' or 'Man the Player' (1938) inspired Caillois who adapted his ideas to classify games by four fundamental categories (2001:10-25):

- 'Agon' – competition with equality of chance
- 'Alea' – chance and random
- 'Mimicry – incessant invention, simulation or role play, for example World of Warcraft
- 'Ilinx' – Greek tern for 'whirlpool' or 'vertigo' – altering perceptions

Geoff Howland (1998a), quoted by Newman (2004), distinguishes five features of video games:

- Graphics
- Sound
- Interface
- Gameplay
- Story

Bell and Howard (2001) also quoted by Newman (1998a) classifies games into seven types:

- Action and Adventure
- Driving and Racing
- First-Person Shooter
- Platform (e.g. guiding an avatar) and Puzzle
- Role-Playing
- Strategy and Simulation
- Sport
- Beat-'em-ups

Newman objected to Bell and Howard on the grounds of lack of definition, i.e. they merely listed terms; however, in the context of this study, Bell's and Howard's classifications are useful because they relate directly different types of interaction. In this research, it is proposed to classify game genres as not comprehensive:

- Action
- Action-Adventure
- Adventure
- Role-Play
- Simulation
- Strategy

Not only can genres be categorized but features of games too. In his book 'Digital Game-Based Learning' (2007), Prensky proposes 'six key structural elements of games':

- Rules
- Goals and Objectives
- Outcomes and Feedback
- Conflict or Competition
- Challenge or Opposition
- Interaction
- Story or Representation

He further categorises game genres as (Prensky 2007:118-130):

- Action
- Adventure
- Fighting
- Puzzle
- Role-Playing
- Simulation
- Sports
- Strategy

Tavinor (2009) defines video games in terms of 'conjunction' (new technology) and 'disjunction' ('*rule and objective gameplay* and *interactive fiction*' *derived from earlier forms of culture*). Conjunction encompasses 'two conditions', the 'digital/visual medium' and the 'entertainment medium'; disjunction is a necessary component of junction. The real point of Tavinor's two conditions is that he separates new technology from traditional culture; his proposition is that digital

games must always incorporate one aspect of disjunction, but usually both: 'rule and objective gameplay' and 'interactive fiction'; the digital element cannot exist in isolation.

Pearce defines game components in his book 'Game as Art: the Aesthetics of Play' as follows:

(a) Parameterised play consisting of rules by which a group of players agree to abide for the duration of the game.
(b) A goal, sometimes expressed as a series of sub-goals that collectively lead to a meta-goal.
(c) Obstacles that create challenges to achieving the goal(s).
(d) Resources, initially provided to players at random or symmetrically, but more often as rewards for overcoming obstacles.
(e) Consequences, which come in the form of either rewards (sometimes as resources) or penalties (sometimes obstacles).
(f) Information: both known and unknown to the players (individually or en masse); progressive information that is revealed over time; and randomly generated information, such as a dice throw or a dial spin. (2006:69)

A comparison of the criteria formulated by the above scholars and the criteria adapted and applied in this study is illustrated in the following table:

Table 1-1 A comparison of the Scholar's criteria

Scholar's Critera									
Site	**Criteria in this study**	**Crawford**	**Caillois**	**Howland**	**Bell & Howard**	**Newman**	**Prensky**	**Tavinor**	**Pearce**
		player perception	**game rules & experience**	**game components**	**gameplay criteria**	**characteristic gameplay & interaction**	**game components, structural criteria**	**relation of game components**	**game components & sub components**
Player	interaction				action & adventure, driving & racing, first-person shooter, role-playing, sport, beat-'em'ups	action, action-adventure, role-play, simulation	action, adventure, fighting, role-playing, simulation, sports		
	role of player		mimicry						
	emotion & experience		ilinx – vertigo of whirlpool					conjunction – entertainment medium	
	skills	perceptual & motor skills			platform				
	problem solving	cognative effort			strategy & simulation	strategy	puzzle, strategy		

Game	visual elements			graphics				conjunction – digital-visual medium	
	sound			sound					
	objectives						goals & objectives	disjunction – rule & objective gameplay	goals, sub-goals, meta-goals
	story			story			story or representation	disjunction – interactive fiction	
	rules & mechanics		agon - competition				rules	disjunction – rule & objective gameplay	obstacles that create challenges, resources; randomly generated information & progressive
	Gameplay and quest		alea – chance & random	gameplay			conflict or competition, challenge or opposition	disjunction – rule & objective gameplay	obstacles that create challenges, resources, consequences – rewards & penalties
	interface			interface			outcomes & feedback		

Crawford's categories stress player perception in terms of skill and cognition. Callois takes the role of player further and also examines rules and how they influence the player. These criteria and how they affect player experience are central to this investigation. Howland's, Prensky's, Tavinor's and Pearce's taxonomies focus on game components. To classify game genre, Howland lists six components which are used to build the game. Prensky's taxonomy, however, is more structural, focusing on game-based learning. Tavinor investigates relations between components. Pearce examines sub-components in depth. Howland's and Newman's framework emphasizes characteristic interaction to classify game genres which are derived from to gameplay.

Diverse taxonomies and nomenclatures of the features and attributes of digital games have been studied to enable formulation of terminology for this research. Extant taxonomies are limiting and lacking. Crawford's and Callois' taxonomies are useful for analyzing player experience but not visual elements and game story. Crawford's classification of genres is limiting because it is based only on characteristic interaction; conversely, Newman is more receptive to new game genres but still excludes player perception. Prensky's classification is different; he lists types of interaction. Tavenor's conjunction-disjunction coupling argues that digital games always incorporate at least one, but usually both, of two pre-digital aspects: 'rule and objective gameplay' or 'interactive fiction'; he lacks detail and examples. However, his contribution provides us with a fundamental of interconnection between game components and player interaction.

Regarding previous taxonomies and their criteria, the main concerns which will be useful in this study are player experience and visual elements. The others are interaction, game components and sub-components such as rules, stories and objectives, and relations between components.

Extant taxonomies label some components and features of games. They can be adapted and expanded to provide a classification system for this study; some terminology may require revision to provide a precise taxonomy. New games appear on the market daily; many mix genres. New features of taxonomy might, therefore, be useful to categorise genres in new games. This writer proposes a new taxonomy, made up of five features of games for the study of World of Warcraft in this research. It is built from components of previous taxonomies which can be applied in this study:

Game Elements	Games are constructed from distinctive elements to create a whole game world. The elements are: visual elements, sound, objectives, rules, user guidance and interface. (Adapted from Prensky, Tavinor and Pearce)

Gameplay Gameplay is how the game is played and the interactivity between player and elements and between players. Gameplay determines genre and game characteristics. During play, players can choose first- and/or third-person perspective. (Adapted from Howland and Newman)

Interactive Story Dynamics of the storyline unify game design. The storyline represents what happens during interactive gameplay. Visual design objectives, rules and quests create the story. The game story is the main story programmed by the designers whereas the player's story is created through freedom of play and choice. The story is made up of many sub-stories and plots. (Adapted from Newman and Prensky)

Experiences Relates to perceptual experiences from meaning making derived from gameplay: playing skills, learning experiences such as problem solving, cooperation, strategic management, etc. Emotions are the product of perceptions. (Adapted from Crawford and Callois)

Game Mechanics Controls and supports gameplay and enforces rules. It is also the structures behind the interface and evident on the screen. Sicart notes that '… game mechanics are methods invoked by agents for interacting with the game world' (2008).

Mixed genres can make a game difficult to classify and blur parameters; therefore, genre classification should be flexible enough to allow reconsideration. Taxonomy helps classify components including visual elements. In this dissertation, the investigation of digital games concentrates on Game Elements, Gameplay and Experiences.

2.1.3 The Evolution of Game Aesthetics

The first two videogames – Tennis for Two (1952) and Spacewar (1962) – were constructed of simple visual elements, with a moving dot on a black and white screen. They were two-dimensional and lacked perspective. The games were very simple and lacked storyline or plot; they focused on movement of the dot and player reaction; they are classified as 'casual games' (Juul 2009). Initially, visual aesthetics was not a consideration; however, decades later, games have a high content with human interaction and advanced visual presentation.

Significant events in the history of games can be listed by year. Notable contributors are Kent (2001), Berens (2009), Weiss (2009) and Donovan (2010). Display and interaction technologies have driven change along with player demand for new and more sophisticated products. This kind of history is useful for

understanding how games change but is not useful for the study of visual aesthetics; visual displays have their own history which is useful. Aesthetic development can also be traced historically.

Historical listing is only one component of taxonomical criteria. Meldgaard (2011) proposed another way to categorize games, namely by degrees of explorative possibilities; the idea has been adapted for use in this study. A new category has been introduced: historical visual development in games using the following taxonomical elements: dimensions of virtual space; quality of graphics; and visual interaction. These criteria developed from my review of game history from1952 until the present (Wolf, 2008; Donovan & Garriott, 2010; Kent, 2010). This visual taxonomy extends from the Game Component; the above taxonomic criteria were developed to classify online games. It is necessary to focus on visual elements from the beginnings of digital games to the present to help develop an appropriate framework to for visual investigation and frame the visual grammar. An advancement in one taxonomy triggers advances in other taxonomies enabling advances from diverse taxonomies to be grouped chronologically into 'generations'; I propose the following four generations in the development of visual display:

(a) Two-dimensional: the graphics are composed of simple elements such as dots, rectangles and triangles; there is no representation of depth; either monochrome or primary colours were possible and images were not sharp. Examples of such games are: Pong, Space Invaders, Pac-Man and Odyssey: the Legend of Nemesis.
(b) 2.5-dimensional or pseudo-three-dimensional: illusion of depth marks the beginning of visual design in the game landscape. The illusion was created through overlapping, foreshortening, spacing, shadows and perspective. The games started to simulate real and fantasy worlds rendered in full colour. The graphics could now provide a sense of a dynamic environment. Players could now control the objects moving inside the game landscape. Players felt that they could walk inside these games and they were able to alternate between first and third person but there was only one camera viewpoint, although it was able to zoom. Examples of such games are: Age of Empire, StarCraft and Grand Theft Auto. Many of these games evolved into three-dimensional versions.
(c) Three-dimensional: although still on a flat screen, there is a strong illusion of three dimensions; it is now possible to look behind objects or turn through 360 degrees. Screens have much improved resolution enhancing the illusion of real life. Players can now change camera viewpoints and move around, walk in, dive and fly their own avatars. Games of this kind have their origins in the 1990s. Mäyrä noted that 'The concept of 3D as

the hallmark of a new era of digital games relates not only to a particular computer graphics technology, but also to a larger trend towards more realistic simulation in computing. The increasing power of computers is used here to recreate such features of reality as laws of physics, for example, in an interactive simulated environment' (2008:95). Three-dimensional games create a sense of 'being there' especially when combined with devices such as special glasses, mice, joysticks and guns; further, some devices can vibrate to create tactile sensations. World of Warcraft is the best-known example of this type of game.

(d) Visual convergence: players interact with game objects and landscapes by means of physically controlled motion-tracking devices, for example holding a steering wheel to 'drive' a car. Perceptions in the game derive from normal but illusory physical sensations. Examples of devices for such games are Kinect and Wii U; the software for these games is normally loaded into the device; some require special glasses whilst others work on conventional computer screens.

Studying the visual history of video games provides a framework to enable us to understand how players' behavior and gameplay practice have changed and developed. The visual history of games illustrates how players' engagement has expanded from the relatively passive to immersion, cooperation between players, teamwork and without limits to time and space.

2.1.4 Are games art?

The aesthetics of art and art theory can be applied to games. If games are an art form, they will share some of the properties of art. We shall, therefore compare games and art.

Scholars have discussed whether games are art. Before starting this discussion we need to clarify what games are. The first videogames were pure entertainment. Games may be used in medicine, commercial and industrial training, education and in the military, etc; likewise, these applications not art. Games are made up of components and properties. Components may be visual design, rules; objectives, etc.; components provide the modes of engagement; players gain experience through engagement. Properties are story, sounds, objects, mechanics (rewards and rules), visual design including landscapes, etc.

Are games art? The following points were garnered from on- and offline debates, particularly an argument between in the Guardian (a London newspaper available online) between Jonathan Jones, a writer on art for the paper and Keith Stuart, its games editor.

(a) Artistic value – Do videogames give artistic value in the same way as art?
(b) Freedom of interaction: videogames are an interactive medium. Players play the games through the dynamic story and experience emotions; games are restricted by rules and limitations of programming. It is the same for the viewer of a work of art; however, questions are raised concerning participation and freedom of interaction without commanding rules as in videogames; conversely, Stuart (2012) argues that the rules and objectives of the game offer 'a space of possibility and meaning' for players.
(c) Art authority: art is created from an original idea; the work of each artist is unique. Videogames, therefore, could be taken to be reproduction. Debate on this issue is ironic because many artists, including Duchamp and Carl Andre create from readymade objects; much contemporary art is constructed by technicians. One designer leads a team to produce a videogame (www.aethetics-online.org and www.guardian.co.uk).

This topic is debated further in 'Videogames and Education', Brown (2008: 21-23, 33-37). The debate should continue; it is too soon to reach conclusions particularly since games are still developing rapidly. Whether games are art or not may not be important; both art and games are forms of cultural expression. To summarise the work Crawford (1984), Koster (1999), Jenkins (2000), Salen and Zimmerman (2004) and Tavinor (2009) on meanings in videogames, games are defined a visual digital art and new media; they are created to give a perceptive experience of reality and are played under the games' rules and objectives. Other games serve education and training, business and industry; enjoyment, similar to that found in entertainment videogames, is a key factor in ensuring that educational and training objectives are effective. Jenkins, Koster and Frasca consider games to be art; Koster suggests that the criteria of art be reconsidered.

Rouse expands the meanings of the games: 'the gameplay is the component of computer games which is found in no other art form: interactivity. Gameplay is the degree and nature of interactivity, i.e., how the player is able to interact with the game-world and how that game-world reacts to the choices the player makes (Rouse III, 2010: xviii).'

There are numerous arguments that games should be considered art; not all games are art. Comparison can be made with film which is well-established as art. Like films, videogames can be divided into genres and subgenres. Some films or sequences in other films are created through computer-graphic software similar to that used for game production. Some examples of unreal, stunning digital film sets are found in Westworld (1973), Futureworld (1976), Star Wars (1977), Tron (1982)

and Sin City (2005); these are popular science fiction films discussed and ranked by audiences and criticized by film theorists. Game and film production often share the same software for similar purposes: creating objects and landscapes from basic art forms such as lines, planes, geometric shapes, colours and textures. The basic art digital art forms are the same as those employed by artists. Short animated sequences, like animated films, are incorporated into videogames. Most videogames have dynamic narratives, in contrast to the linear narratives of films; however, they share similar primary storylines. Just as some films are not are art, not all video games are art; it is reasonable to use art and film theory to theory to analyze and discuss games.

2.1.5. Aesthetic Properties and Values

I make the claim for games as art on the grounds that games are composed of the same elements as other arts. Games borrow from literature, mythology, and techniques from film.

The aesthetic experience for gameplayers derives from the visual elements and interaction. Aesthetics is the appreciation of beauty which depends on the individuals responses. Tomlin (2008) borrowed from Shusterman (2008) to formulate four conceptual dimensions of the aesthetic experience:

> *'(a) Its **evaluative dimension** (it is essentially valuable and enjoyable);*
> *(b) Its **phenomenological dimension** (it is something vividly felt and subjectively savored, affectively absorbing us and focusing our attention on its immediate presence and thus standing out from the ordinary flow of routine experience);*
> *(c) Its **semantic dimension** (it is a meaningful experience, not mere sensation. Its affective power and meaning together explain how aesthetic experience can be so transfigurative);*
> *(d) Its **demarcational-definitional dimension** (it is a distinctive experience closely identified with the distinction of fine art and representing a defining aim of art) (2008:3).'*

Thus, aesthetics is based on judgments and value. Aesthetic judgment depends on experience and engagement. Info-aesthetics, a term coined by Manovich (2001), '… scans contemporary culture to detect emerging aesthetics and computer-based cultural forms specific to the information society. … Info-aesthetics suggests that the new aesthetics already exists in information interfaces and information tools that we use in everyday life.' Quaranta (2007) adapts Manovich's ideas about info-aesthetics to study game aesthetics; game aesthetics are a form of info-aesthetics. Quaranta focuses on the photorealism of games as a way to gain experience. Technical advances in image quality have allowed created images to achieve the illusion of being photorealistic; often though, the full potential of technical

advances may not be realized due to limited processor capacity or narrow bandwidth.

In his book 'Neo-baroque: A sign of the times' (1992), Calabrese discusses aesthetic values in texts. I have adapted his ideas for values of attributes as judgment. 'Neo-baroque' is Calabrese's term to label contemporary objects rather than 'post-modern'. He proposes a system of categories to value texts as 'valorising discourses'. He judges attributes by their polarity or differences and assigns them values. Beauty and ugliness are assigned positive or negative values within aesthetic categories. The categories had been suggested previously by Robert Blanché in his *Aesthetic Categories*; his categories were produced by combining semiotic signs. The values assigned in each category are flexible and can be modified. Calabrese (1992:21) summarised his work as follows:

> *It can be summarized very briefly in the following way. First: to analyze cultural phenomena as texts, independently of a search for extratextual explanations. Second: to identify each text's underlying morphologies, articulated at varying levels of abstraction. Third: to distinguish the identification of these morphologies from that of the value judgments to which they have been subjected by different cultures. Fourth: to identify the axiological system of these value judgments. Fifth: to observe the duration and dynamics of both the morphologies and the value judgments that influences them. Sixth: to define a "taste" or "style" as a tendency to attach value to certain morphologies and to their dynamics,..(Calabrese, 1992: 21)*

Calabrese employs a semiotic perspective to study aesthetic attributes. This parallels semiotic systems in games; players have always made informal aesthetic judgments; Calabrese's ideas can be adapted and applied to academic study of games.

Budd (2008) defines the following aesthetic components:

> *'**An aesthetic judgment** is a judgment that ascribes (positive or negative) aesthetic value to an item.*
> ***An aesthetic pleasure** is a pleasure taken in the apparent perception or imaginative realization of aesthetic value.*
> ***An aesthetic property** of an item is any property of it that has aesthetic value.*
> ***An aesthetic attitude** is an attitude of a kind conducive to a reliable perceptual or imagination-based judgment of aesthetic value' (2008:18).*

Aesthetic value is, therefore, a combination of Budd's four aesthetic components. Players starting a game new to them, when interviewed, give responses which approximate to Budd's aesthetic components; the players are unaware that they are

making aesthetic judgments; this has been confirmed in numerous surveys and research interviews (see chapter 6). With regard to WoW, 93% of initial players, from fifteen interviewed, responded positively the to the game's visual aesthetics.

Of Tomlin's four dimensions, three are employed in this research to frame player experience (chapter 5) in WoW: (a) the evaluative dimension; (b) the phenomenological dimension; (c) the semantic dimension. These dimensions will be used to evaluate player experience in terms of value (here meaning that it is worth the time spent playing and not doing something else); enjoyment; continuity (it holds the players' attention); and meaningful experience (for example problem solving and teamwork).

2.2 Research Landscape

2.2.1 Games and Research

Games are complex systems. Games can be analysed in terms of visual signs, culture, interaction, etc. Theoretical frameworks cannot be adopted directly from other media; the must be adapted. All scholars adopt and adapt theoretical frameworks from other media: semiotics, systematic functional grammar, multimodal discourse analysis, etc. These approaches provide a starting point for this study.

Peirce, a mathematician, laid the foundations of semiotics; he devised a triadic system in which the three components are combined by semiosis which he defines as 'an action or influence which cooperates with three components'. The three components are representamen or sign form; object or referant; and interpretant or meaning or relationship; the underlined terms are employed in this research. Pierce's framework is a useful tool for game researchers.

Ferdinand de Saussure (1957) studied linguistic signs. He divided signs into signified (concept) and signifier (sound image). He noted that signs are bound by a chain of elements such as function and meaning. De Saussure's concept can be adopted and adapted to analyse interconnections between signs in the game; this concept will be further discussed in chapter 4.

A practical approach to studying games is required, drawing on and combining theoretical frameworks; games, gameplayers and gameplay must all be taken into account. Any single theoretical approach would impose limitations on the research. A game is a hybrid system of signs of great complexity; it is hybrid because the signs are drawn from different media and new signs are created through interaction, both between players and between players and the game. Cubitt (2002) introduces the temporal dimension in communication for images and moving images which is usually overlooked in game research. It should be possible to adapt the frameworks

of this research to study of other visual arts and applications in education, business, training, etc. Rose (2001), and Gillian and Rose (2007) propose site modalities and methodology for interpretation of visual material; the site modalities are site of production; site of image; and site of audiences (these are described in detail below; see figure 2-1).

Rose's concept of site modalities is effectively illustrated in his own diagram (figure 2-1). Rose's ideas can be adapted for this study to define sites and modalities in World of Warcraft. Rose does not take interaction into account but it must, nevertheless, be integrated into his framework. In my version (figure 2-2), I have altered Rose's labels to fit the context of digital games and to comply with Märyä's three main areas: the game and its structure; gameplayers and their behavior; and game design and development; the three areas are connected and study of one is impossible without reference to the other two. This will be further explained in chapter 3.

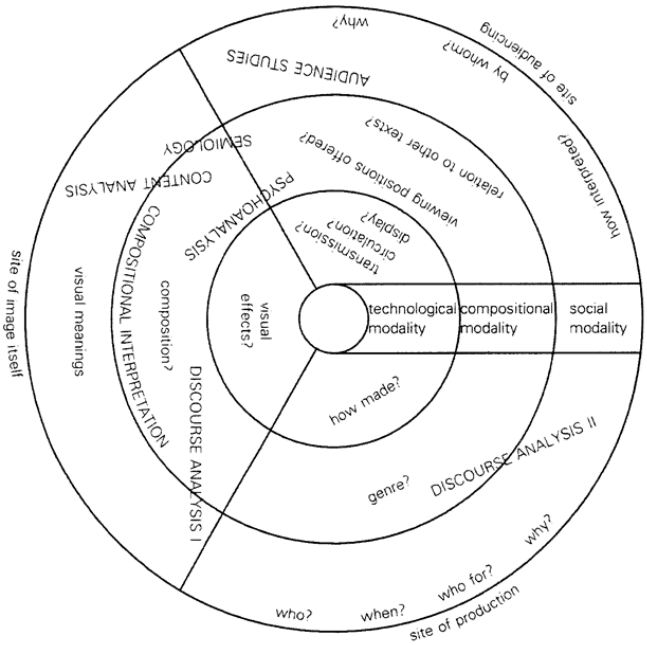

Figure 2-1 Sites modalities and methods for interpretation of visual materials (Rose, 2001:30)

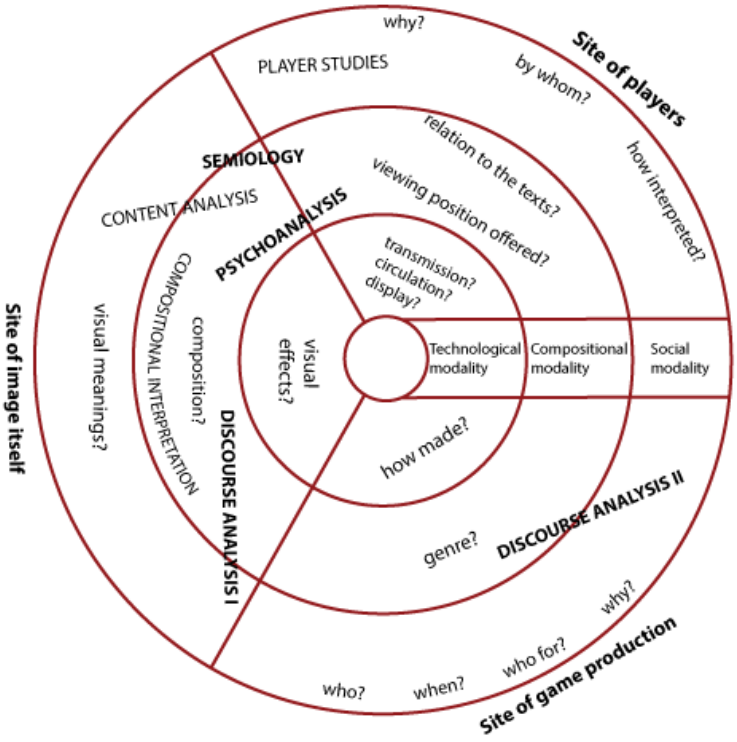

Figure 2-2 Sites of modalities and methods for game interpretation

From the above, it can be seen that there are three sites: the game, the player; and production. The production site is not of direct concern in this study but it will impinge and be impinged on by the other two sites. No single theoretical approach or analytical framework is appropriate or completely satisfactory for both the site of the game and the site of the player; therefore, different approaches and frameworks will be employed for each of these two sites.

Jones' and Norris' 'discourse in action' (2005) applies to media generally; I have adapted as a practical means it to interpret player activities and write about connections between the site of the player, the site of game and interaction. Regarding adapting Rose's concept to World of Warcraft, each site requires an appropriate framework to enable investigation. In this study, therefore, I will employ various analytical frameworks. I propose to research the theory and

practice of (i) the site of the game; and (ii) the site of the player; the site of game production will not be used in this study:

(i) The site of the game:
  (a) Visual semiotic analysis – interpretation of visual signs and composition of visual signs for meanings – is the crucial first step.
  (b) Art theory including gestalt – a whole that is more than the sum of its parts – is employed to understand the principles of visual composition.

(ii) The site of the player:
  (c) Multimodal discourse analysis of player reactions: gestures and verbal reactions whilst playing and interviews after playing.
  (d) Social semiotics – the way that a player learns, interacts and participates with other players within the gameplay; this incorporates group-play, two or more players in the same room interacting with each other, and distant players whose only communication is through the game.

These complementary sites and their theoretical practices will be described in chapter 4.

Reading Images: the Grammar of Visual Design by Kress and Leeuwen (2006) provides a framework for analysis of social interactions between audiences and artworks and advertising; this is adapted here to study and record interactions between player and game. Objects contain meanings; further meanings are created by the composition of the objects; by analogy with language, words contain meanings and further meanings such as time, number, etc., are created or partly created by grammar. Rose (2011) suggests a range of methods to analyse images from paintings to visual media: content analysis, semiology, psychoanalysis, discourse analysis and mixing of these methods. During the last fifteen years, visual analysis has expanded into new fields, moving from fine arts to videogames, comics, advertising and so on; they share the visual component. Irit Rogoff, mentioned by Lübbren & Crouch (2003) argues that manifestations of the visual do not stop at the optical, but incorporate audio, the spatial and audience expectations.

2.2.2 Emergent visual games: the need for a new 'visual grammar' and visual language

Recent development of human communication can be traced through gestures, posture, sound, text, painting, still images, moving images, and 'meta-medium'. Manovich (2002) discusses new methods of communication generated by software. Manovich used 'meta-medium' to describe software which extracts shots from scenes in a film, present them in one filmstrip and view them as a sequence of still

images. A two-hour film contains more than twelve million frames; each conveys signs for meaning-making, interpretation and construction of knowledge. Most new and existing media combine visual media principles such as form, movement, perspective, composition, etc.; their boundaries are blurred. Web technology, online games, digital films and digital simulations are convergent forms of media in virtual space. The convergence of media is a convergence of cultures (Jenkins (2006) which has become visual digital culture (Darley 2000). The convergence of contemporary media (Buckingham 2006) has had a profound effect on learning and the emergence of new cultural forms; participatory culture emerges from, absorbs and responds to new media. (Jenkins 2009). Visual technology increases the power of digital media for users; social interaction takes place through these media. New media establish new cultural practices. Visual digital media have shifted the balance of power away from media creator to user through multiple channels of communication.

Barthes (1964) notes that 'the most interesting systems … are complex systems in which different substances are engaged.' In cinema, television and advertising, the senses are subjected to the concerted action of a collection of images, sounds and written words.' These media also utilize the basic elements of visual design: points, light, colour, textures, space, shape and composition. These basic elements, which Saint-Martin calls 'the coloreme', are common to all visual media including, painting, drawing, architecture, photography, film, websites and multimedia and most recently digital games (discussed further in chapter 4). For me, it is 'the elemental system of signs in visual language' which can be adapted for visual media. It encapsulates a collective meaning of semiotic (Barthes 1967) or 'visual language'. Jansson and Lagerkvist (2009) used the terms 'encapsulate, and 'decaptulate' to describe the relationship between the audience and the city. Objects are created from the basic elements of visual design; the meanings of the objects are encapsulated through the designer's experience. Players 'decaptulate' or decode meanings from the objects (figure 5) – it is the reverse process of encapsulation; there are many factors which influence encapsulation and decaptulation such as emotion, interference, obstacles, context, motivation , similarity, stimuli, references, etc. (Hayes & Schulze 1977; Blake & Fox 1969; and Eriksen and Hoffman 1972).

Visual language is not only producing a 'set of realities' which are constructed by the different realities which are produced by consumers individually; images are also reproduced socially depending on the common interest of a group. Created realities circulated in different media. 'They [realities] are ideological. Visual structures are not merely formal: they have a deeply important semantic dimension' (Kress & van Leeuwen 2006).

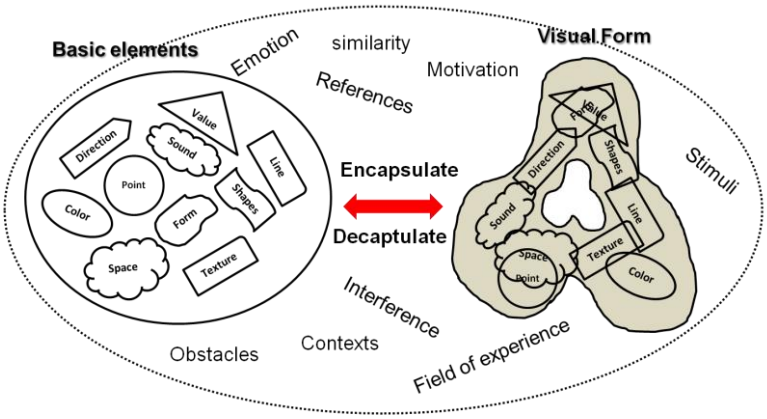

Figure 2-3 Elements system of sign in visual design

Media are becoming more visual in response to new technology. Nicholas Mirzoeff (1992, 2002) defines visual technology as 'any form of apparatus either designed to be looked at or to enhance natural vision, from oil paintings, television and the internet.' Some believe that digital technology will shift power from producer to consumer; consumers will always be limited by the technology of their own time. Software, for example, will not reform beyond its maximum capabilities. Gameplayers play by rules and objectives which may limit imagination; however, an online game opens opportunities for players to create game objects during play and to write a gameplay story of their own by selecting a quest and game territory. Designers and consumers bring experience to games. Elements of traditional media are used or adapted in new media.

Digital media, as previously mentioned, can be divided into three sites; production, the game and gameplayers (figure 2-4). Designers belong in the production site. The gameplayer site is both physical and virtual. The line of demarcation between designer and player in online digital games is blurred; their sites are dynamic and players are assigned a creative role. The game is focused on visual design. Game designers receive feedback from players; conversely some players become designers. The site of the game encompasses both game content (story and rewards) and visual design. Drawing on experience, the designer creates and encodes the game content whilst the player interprets and decodes it; designer and player are both subject to the same system of signs of visual design (figure 2-4).

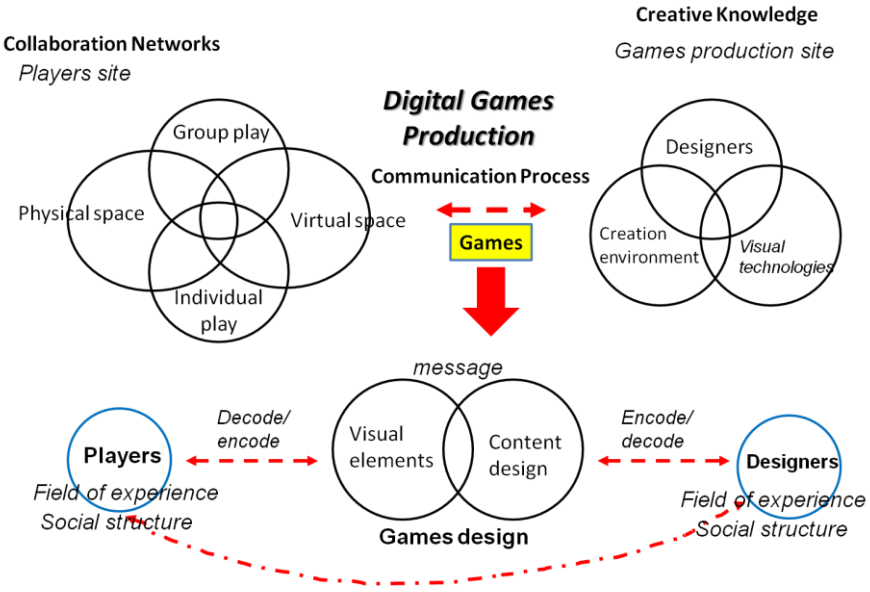

Figure 2-4 Visual digital production landscape

Visual elements circulate from period to period and from medium to medium; basic visual elements remain unchanged (Baxandall & Chester 1988). Visual grammar is reused from generation to generation and from medium to medium. Film grammar and film making styles, techniques and devices manipulate audiences' emotions and reactions (Marsh et al 2008); games borrow from the visual grammar of film for the same purpose, and not only from film but from all other visual arts. The three-act structure of film language is reproduced in game design. The borrowing may be more than visual language; games can incorporate short film sequences, especially animation. All visual forms and functions have been imitated in games; new meanings may be constructed from old forms in relation to social context. To investigate an online game, therefore, we need to employ visual grammars, such as film language and art principles from other media in which are adopted to create game language.

Cinema audiences are unaware of a film's visual language although it profoundly affects their emotional reactions and enjoyment; the same is true of games; gameplayers are unaware of the role of visual language in attracting them to play and holding their attention. Theoretical frameworks and the analytical methods

derived from them have limited practical value but in combination, they are valuable tools.

To appreciate visual culture requires a theoretical framework coupled with practised observation. In the early years of visual studies, Cubitt (2002) noted '[we] have the opportunity to move beyond the banalities of ideology critique to become a tool in the making of new media and new principles for the making and interacting with them.' Visual media are going beyond existing visual theory and extending the range of visual grammar; as a result, a language specifically for games is required. To sum up, I have established site modalities of game landscapes and elements of the system of signs in visual landscapes (see figures 2-2, 2-3 and 2-4).

2.2.3 The Visual Landscape of Language in Games

Gameplay can be divided into two main components: the visual material of play, or content, and the gameplay or interaction. Games are mostly a perceptual experience from visual sensations and interactions. Aesthetic meanings are perceived primarily through visual objects. The visual aesthetic experience occurs when the player perceives a visual object and makes a judgment. I concluded earlier that games are art; visual components can be judged aesthetically. Nardi (2010) investigated WoW through an anthropological approach; she concluded that visual aesthetics in games a critical factor in attracting and retaining players. The visual design of WoW, including colour, props, characters, animation buildings and landscape are significant contributors to player experience. Frameworks exist to study visual aesthetics and design: theoretical, experimental and analytical; these frameworks will be adapted to meet the requirements of this research.

2.2.3.1 From Aesthetics to Visual Language

Theories of language, literature, art and film are well established. There are theories of games but digital games are a new phenomenon and specific theories relating to them are not firmly established; this is particularly true of visual design. It is my intention in this research to develop a new theoretical framework for the visual grammar of digital games. WoW is a synecdoche, it represents all digital games to create a visual grammar that can be applied to all visual games.

Some scholars are trying to formulate visual grammars for digital games but not, as far as I am aware, for the particular context that I am interested in. I start by looking at available research on the art of digital games.

Pearce (2006), a game artist and designer, claims, in her book 'Games as Art: The Aesthetics of Play' that, in creating art games, gameplayers take the role of co-creator; when artists use games as representations of art they have to balance constrains and freedom. She notes that:

> *'In digital game culture, there is less and less of a boundary between virtuosity as a player and virtuosity as a creator. In the dynamic of a play-based artistic domain, there is a fluidity, a continuum between play and creation, and in this way, the "player" of a game or score is also a co-creator or performer of the work. Within game culture itself, play and creation often fuse such that playing the game is a form of consensual performance' (2008:82).*

Pearce argues that the role of gameplayer has changed to become co-creator; further, the gameplayer is has taken on the role of artist. The gameplayer is given authority to edit some features of the game. She begins by treating the gameplayer as a viewer who develops into co-creator and artist who plays and performs and acquires experience.

When game art first started to develop, artists used concepts from games in their art. Flanagan (2009) mentions that, in the 1960s and 70s, artists experimented with animated texts or word play; they treated written texts as an art object ('words material'); play and art had coincided. Flanagan also refers to the notion of Sutton-Smith that '… play and art may share invention and personification, but not sensuality. Also, play constitutes a system of symbolic forms that may carry their own objective codes' (2009:138). Play is the crucial component of language games, role play and experimental art. Adapting art concepts to games helps us to define components in terms which game-art studies have previously employed.

In game studies, initially few scholars investigated the language of games. Mäyrä studied game language by adopting Ludwig Wittgenstein's concept of language games by focusing on the activities within games. One reason is that games are rule-based making them more uniform and simpler. For Brown (2008), videogames are an infant art form; to understand this new art form, we first need to understand established arts such as films, performance, art, architecture and so on. Brown also proposes to incorporate the new aesthetics of interactivity. He notes that:

> *'As visual art, videogames have followed the rapid parallel development of computer technology, and while they have borrowed concepts from other art forms, they have also evolved a unique aesthetic of presence and action, founded on the laws of motion and perspective and on our perceptual and psychological relations to space(2008:23).'*

David Buckingham (2010) establishes a framework for game literacy with four components:

(a) Representation is realism through graphics, sounds and verbal language; it incorporates characters; virtual identities of social groups; and game genre.

(b) Production comprises auteur; technology and software; game designers and production team; and the relationship of games with other media.

(c) Audience encompasses experience and pleasure of playing derived from rules and structures. It includes social and interpersonal play and individual responsibility; discussion of games in other media and advice to players through fan culture in weblogs, fan art, machinima (the use of real-time computer graphics engines to create a cinematic animation), conferences, etc.

(d) Language: Buckingham provides the following list:

- *The functions of verbal text (audio and written text), and non-verbal text such as still and moving images, sounds and music.*
- *The distinctive properties of game genres such as codes and conventions, including the character of gameplay in terms of interactivity or playability.*
- *The characteristic and organization of space and time in different game genres, and the setting role of player in the game landscape position.*
- *The components of games properties such as rules, economies, objectives, obstacles, and other (Buckingham 2010:66-67).*

In his ideas about game language, Buckingham focuses on textual functions (modes); game properties (objects and their qualities); gameplay; interactions; and game landscape. Buckingham's framework can be adapted to define components of World of Warcraft and classify features of each component. The components and features which will frame the visual grammar of World of Warcraft are important. Buckingham's components will subsequently be applied to the theoretical foundations in chapters 4 and 5. Games have their own language which is incomprehensible to the uninitiated. Buckingham's framework provides an overview; however, one game may be assigned more than one genre and many sub-genres. An analytical framework created for one genre or sub-genre may be unsuited to other genres or sub-genres. The analytical framework to be established in this research may not be applicable the study other games which have different characteristic gameplay.

To sum up, some scholars study games with an analytical framework based on a single theory; others employ multiple or combined analytical frameworks based on more than one theory. An ethnographical analytical framework is suited to game culture, whereas art theory is more appropriate for visual aesthetics and their properties; other analytical frameworks are employed as required in accordance with particular objectives. The analytical framework most relevant to my study is

Buckingham's but will be complemented by others. I draw mainly on two components of Buckingham's analytical framework: Audience and Language.

2.2.3.2. Visual Grammar in Online Games

The word 'visual', according to the Oxford English Dictionary entered late Middle English, 'originally describing a beam imagined to proceed from the eye and make vision possible' – its origin is the late Latin 'visualis'; from Latin 'visus', 'sight'; and 'videre', 'to see'. 'Grammar' has its origin in Greek 'grammatikē' ('tekhnē'), via French 'gramaire' to 'gramma' and ultimately 'grammar'; it has several meanings (oxforddictionaries.com):

- The whole system and structure of a language or of languages in general, usually taken as consisting of syntax and morphology (including inflexions) and sometimes also phonology and semantics.
- A particular analysis of the system and structure of language or of a specific language.
- A set of actual or presumed prescriptive notions about correct use of a language.
- The basic elements of an area of knowledge or skill.
- Computing a set of rules governing what strings are valid or allowable in a language or text.

For my research, the first definition relates most closely to its meaning in the term 'visual grammar'; however, all the above definitions are inadequate in one respect, namely that certain meanings are expressed, or partly expressed, through application of grammar; in European languages, these meanings include time, number, *any* or *particular* and possession. For my research, the analogy of comparing visual grammar with grammar of language is crucial; visual grammar is not visual structures in isolation but is deeply involved with the meanings expressed by those structures. Just as grammar is component of language, or any language, visual grammar is a component of visual language.

'Visual language' is defined by various scholars; definitions relevant to this research are:

(a) A 'system where basic elements are interrelated according to certain laws or regularities' (Saint-Martin 1990)
(b) 'It is based on the tight integration of words and visual elements' (Horn 1998)

In this research, I define 'visual grammar' as 'the principles and rules for structuring the basic forms of visual elements; creating structures creates meanings – structures are decoded to obtain further meanings.

Visual grammar of games is the key component in performing this research; since digital games are still in their infancy, frameworks for study of the grammar of digital games are not yet established. Video games are a new medium. Video games are also a convergent medium; games borrow from all arts including language, literature, painting, sculpture, architecture and film. Drawing on theories of other media, a practical, analytical framework for digital games will be established. In one respect, digital games differ from other arts; they are more than interactive medium; gameplayers are co-creators – they create stories and objects – alongside designers. This research focuses on the site of the audience or player, their responses to and interactions with the visual grammar of the game.

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CHAPTER 3. RESEARCH METHODS AND DATA COLLECTION

Chapters 1 and 2 provide an overview of the research, the research landscape, questions to be answered by the research and the main theoretical foundations. In this chapter, theoretical concepts will be discussed in preparation for their selection and application; the focus will shift from digital games in general to the game chosen as a case study in this research: World of Warcraft.

3.1 Research Approaches

This research focuses on two sites and the interaction which connects them:

(a) Site of the Game – the analytical framework to be applied in this research is a combination of the work of these scholars: Saint Martin's visual semiotics (1990); Arnheim's theory of visual perception (1974); and gestalt theory from many writers.
(b) Site of Player – the analytical framework draws on Halliday's social semiotics (1985); multimodal discourse analysis of Norris & Jones (2005), Kress & van Leeuwen (2001) and Rose (2001); van Leeuwen's modes of analysis of speech, music and sound (1999); Martinec's gestures (2000); and Norris's interactions (2004).
(c) Site of production – not of primary concern in this research except insofar as the sites of game and player interact with it.
(d) Interaction – integrated with the analytical frameworks of the sites of game and player.

These models and distinctions will be used for the theoretical foundation in chapter 4.

Some scholars suggest methodologies for investigating games:

(a) Corneliussen and Rettberg (2008) recommend applying integrated methods to collect data in the environment of WoW such as observations, player interviews, and online surveys.
(b) Mäyrä (2008) suggests methodologies to investigate player experience. He mentions that scholars should focus on group interviews, observation, ethnography and practical research methods; he recommends, further, that 'A video recording of events captured from inside the game can be combined and synchronized with another video feed which records the

> expressions, gestures and verbal comments made by players during the play, opening many opportunities for later analysis' (2008:164). This proved to be valuable advice for me: I synchronised gameplay and player experience.

All aspects of and steps in my research were conducted in the context of World of Warcraft; the sequence of my research is as follows (and displayed skeletally in the table):

Table 3-1 Research and Development Process

Step No	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
1	Initial research into WoW	To understand the ethos and practice of WoW		Literature search: academic and anecdotal (i.e. players' comments) – online, journals and books	Classify and store for future reference
2	Personal gameplay	To understand WoW and its environment	Myself	Participate in Wow online for 2 years and record and analyse games; immersion in the ethos of the game; make notes about the game	Digital record of gameplay; notes on aspects of the game. Data classified as a) game objects and visual elements (b) quests and tasks in game (c) meanings of game objects (d) interactions (e) rules and mechanics – and stored for future reference
3	Interview game designers; observe game production – not WoW	To understand how: designers develop concepts and story; game development process from concept to details	Game designers from educational institutions	This process starts with designing an interview question based on the result from Step 1 and 2: (a) interviews with designers: questionnaires, notes and sound recordings (b) production process: video recordings and photographs	Prepared and stored for future reference
4	Tentative framing of a Visual Grammar for Online Games	To commence process of framing a Visual Grammar for Online Games		Constructing a Visual Grammar for Online Games and analytical tools from extant visual theories; data collected in steps 1 to 3; and personal	

Step No	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
				experience	
5	Visual analysis of WoW to test Visual Grammar for Online Games framed in step 4	To trial tentative version of a Visual Grammar for Online Games		Apply theoretical and practical frameworks developed in step 4 to data collected in steps 1 to 3; Analyse results to extract unsatisfactory components; analyse and modify unsatisfactory components.	
6	Adjusting theoretical and analytical frameworks from experience gained in step 4	To modify and test the Visual Grammar for Online Games to produce a final version which performs well both theoretically and practically		Modify theoretical and practical frameworks and repeat steps 4 and 5; alternative versions can be retested simultaneously; further gameplay also employed to enable test different versions	Repetition of steps 4 and 5 in the context of modified theoretical and practical frameworks
7	A working version of a Visual Grammar for Online Games	To formulate an initial working version of a Visual Grammar for Online Games		Assemble all satisfactory components to compile a provisional version	
8a	Field testing of the working version of a Visual Grammar	To further develop a Visual Grammar for Online Games	15 players playing WoW in groups	Game workshop; observation of gameplayers during play: 30 minutes for play and 30 minutes for interview	Simultaneous software recording of gameplay and video recording of players playing WoW; retained for

Step No	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
	for Online Games				analysis in step 8b
8b				Open-question interviews with gameplayers whilst watching and analyzing their own gameplay	Video recordings of interviews – interview questions focusing on visual grammar and player experience
9	Analyse data from steps 7, 8a and 8b in the context of visual grammar formulated in step 7	To revise the working version of the Visual Grammar for Online Games		Data from step 7, 8a and 8b used to revise the working version of the Visual Grammar for Online Games in the light of observation of and interviews with players, and the players own analysis of the games they had played	
10	Verify that theoretical and analytical frameworks are satisfactory	To verify that all data has been interpreted accurately and ensure that no mistakes have occurred		Verification and confirmation of lack of errors in all stages of the research to date; re-analyse data from workshop in context of any changes to theoretical and analytical frameworks from step 9	

Step No	Research steps	Field and practical work			
		Aims	**Participants**	**Methodologies, activities and materials**	**Data and analysis**
11	Formulate a definitive Visual Grammar for WoW	A Visual Grammar for one game as a representative of all online digital games as a benchmark for future research in this field with possible applications in education, training, medicine, etc.		A final revision and checking of all details and research to date	

There are three types of data collection: visual elements in the game; gameplay from my personal online gameplay; and in the game workshop.

I shall take components of existing visual theories to create a unified theoretical base appropriate to the study of online digital games. This is a study of one game, World of Warcraft, as a representative of all online digital games. Data will be collected by observing, interviewing and recording players and games whilst they are playing them in game workshops. This data will be analysed with new tools in terms of simultaneous visual design and player perception to create a new visual grammar in accordance with the unified theory. (When players react, what is happening onscreen? How do players respond to what is happening onscreen? These questions are the foundation the experimental component of my research.)

Players playing WoW during step 8a and the follow-up interviews in step 8b were fully recorded on video; additionally, interviews were transcribed. Playing time and interviews were each about half an hour per player. The three video recordings for each player were synchronized to conduct visual grammatical analysis.

3.2 Players and networks

WoW is a hierarchical of game; players belong to communities (or guilds) and may belong to a group, or more than one group within their community; Players can play individually but are still members of a community. Players can communicate with some or all other players in his or her community; communication can take place internally or externally via the internet, conferences, game cafés, etc. This research is concerned with constructing a visual grammar focused on individual players and interactions between them.

3.3 A Brief History of World of Warcraft

WoW is a complicated game; it can be categorized under many genres and sub-genres depending on the criteria and taxonomies which scholars apply to meet their objectives. In this study, World of Warcraft is categorised by characteristic gameplay and its components. It is a 'massively multiplayer online role-playing game', or MMORPG which was introduced to the public in November 2004. In 2010, the Annual Report of Blizzard Entertainment reported that there were twelve million subscribers. Reasons for the choice of WoW for this research have already been discussed in the Chapter 1: Introduction.

3.3.1 Characteristics of World of Warcraft

As an MMORPG, players must subscribe. Players chose an avatar (virtual character) from a list but can change many of its features. Players may change their avatar's features to match their own, or whatever they may choose. MacCallum and Parsler (2008: 206) note that WoW, as a role-playing game, 'describes not the spontaneous acting out of a character, but refers to game mechanics: levels, character classes, and, to some extent, the high fantasy setting of the game itself.'

The World of Warcraft game itself is inspired by and borrows from myths, Lord of the Rings, games like Dungeons and Dragons, films, etc. This is best decribed by Nobaew & Ryberg (2012):

> *'The storytelling in World of Warcraft borrows the story structure concepts from various myths and fictions. This game remediates the preexisting mythological cosmologies and characterizes the genre of high fantasy into the online game context (Tanya Krzywinska 2006). Game designers make use of to the knowledge of these myths when they design the game story concept, game themes, game quests, characters, props, sets, and game landscape (gamescape). Furthermore in WoW, game designers not only use the symbolism from an ancient mythological and fictional concept, but also employ contemporary fictions, for instance, a Panda theme -Pandarian. Pandarian is the last continent of WoW zone which borrows the story concept from an animation movie name Kung Fu Panda. This game landscape theme is designed by mixing a fantasy world and China's worldview to represent the complex ecosystem of the ancient realm of Pandarian which shows the indigenous races and exotic creatures of Chinese culture. According to Krzywinska it is noted that all game quests tie into mythic form through the rhetorical style in the game context, such as dialogue, written, game structure, and game content. As Greek myth lends the story concept to WoW; therefore, using a story structure framework from Aristotle's Poetics as a departure point is more reasonable for analyzing' MMORPGs(Nobaew & Ryberg 2012).*

World of Warcraft is set on a planet called Azeroth which has a long history of conflict between two factions, the Horde and the Alliance. The third expansion of WoW, Cataclysm, is employed in this study. In Cataclysm, the Horde is made up of six races: Bllod Elf, Orc, Tauren, Troll, Undead and Worgen; the Alliance, likewise, is made up of six races: Draenei, Dwarf, Gnome, Human, Night Elf and Goblin. Players can choose to belong to one race and create their own avatar in combination with one of ten classes: Death Knight, Druid, Hunter, Mage, Paladin, Priest, Rogue, Shaman, Warlock and Warrior: some classes are available for players with high-level skills and some races cannot combine with some classes. It is possible to penetrate deeper into the complications and restrictions in the game but this is beyond the scope of this research. Some players are experts on the game's laws; for them, this is major attraction of the game. Further information can be found at:

www.wowhead.com/news=174515/cataclysm-new-class-race-combinations

3.3.2 Quests and Types of Quest in World of Warcraft

There are many types of quest in WoW; some involve simple tasks and some complex. Quests in WoW are classified into nine types: Kill, Collection, Delivery, Escort, Faction, Class, Quest chains, Elite and Dungeon (Davis 2007). In this study, analysis starts with investigation of 1,000 quests in my own gameplay in four limited versions of the game. Some of my quests did not correspond with established quest types because new quests have been introduced in new or extended versions of the game; these quests needed to be reclassified in order to be able to analyse the gameplay data and formulate analytical methodology. My expanded classifications of quest types are described in chapter 6. Quest types will be important later for visual analysis and player interactions.

Corneliussen and Rettberg (2008) suggest that researchers need to concentrate on both cultural factors and the game; they require different analytical tools, concepts and methods to understand the game thoroughly. Data was collected from three sources; game production (pre-survey), a game workshop and online gameplaying.

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CHAPTER 4. THEORETICAL FOUNDATIONS

Investigation of visual grammar in a three-dimensional online game involves two fields of study: visual components of the game images (or site of the game), gameplay (or site of the player). The distinctive sites and theoretical practices applied in this chapter are:

(i) The site of the game:
  (a) Visual semiotic analysis
  (b) Art theory including gestalt

(ii) The site of the player:
  (a) Multimodal discourse analysis of player reactions
  (b) Social semiotics

Additionally, there is interaction between the sites; further connections are provided by technological, compositional and social modalities (Rose 2001) (described in chapter 3). Buckingham's concept of 'Representation' will also be applied (as discussed in chapter 2). Semiotics and Art Theory are the primary academic fields underlying this research, drawing specifically on multimodal discourse analysis and visual semiotics; multimodal discourse analysis is used to analyse gameplay, interactions and player experience; visual semiotics is used to analyse the site of the game and assist in framing visual grammar. The theoretical discussions in this chapter are divided into two parts: "Site of the Game" (which will be analysed in chapter 5) and "Site of the Player" (which will be analysed in chapter 6). Although analysis of the two sites is initially independent, results will be combined in chapter 7.

The two main fields of study share a common origin: Hjelmslev's (1943) 'Plane of Language' has two components: Content Plane and Expression Plane (see 4.2). Part 1 brings together the Umberto Eco's theory of sign production and Saint-Martin's concept of visual semiotics; Eco combines Hjelmslev's expression plane with Peirce's semiotic sand Jacobson's communication model. In Part 2, Halliday's social semiotics is applied in conjunction with other modalities to construct the analytical framework of the site of the player.

Part I: The Theoretical Foundation of Visual Grammar

Part I:

- discusses theories of visual grammar from other arts
- considers extant theories of visual grammar relating to digital games
- reviews available analytical methodologies applied to digital games

The theoretical foundations in part 1 are summarised in table 2 to avoid confusion because different scholars use similar terms with different meanings and different terms with similar meanings.

Table 4-1 The theoretical foundations of visual grammar: explanation of terms

Saussure	**Signs**	**Sign distinctions**	
	Signifier	Form	
		Substance	
	Signified	Form	
		Substance	
Hjemslev	**Planes** – equivalent to Saussure's signs	**Four strata** – equivalent to Saussure's distinctions	
	Expression plane - signifier	Expression-form	
		Expression-substance	
	Content plane - signified	Content-form	
		Content-substance	
Eco	**Sign** – equivalent to Hjemslev's plane	**Planes** – equivalent to Hjemslev's srata	
	Expression-form	Expression-plane	
		Content-plane	
	Content-form	Expression-plane	
		Content-plane	
Arnheim	**Principles of visual peception**		
	Balance		
	Shape		
	Form		
	Growth		
	Space		
	Light		
	Colour		
	Movement		
	Dynamics		
	Expression		

Table 4-2 The theoretical foundations of visual grammar: explanation of terms (continue)

	Concepts	**Levels of variables**	**Variables**	
			groups	**Distinct categories**
Saint-Martin	Basic plane – two dimensional	The primary level of variables – coloremes	Plastic variables	Texture colour
			Conceptual variables	Dimension Boundaries Vectoriality Implantation or position
		The second level of variables – syntactics		
	Virtual cube – constructed from basic plane – three dimensional	The primary level of variables – coloremes	Plastic variables	Texture colour
			Conceptual variables	Dimension Boundaries Vectoriality Implantation or position
		The second level of variables – syntactics		
	Environment – constructed from basic plane and virtual cube – multi dimensional	The primary level of variables – coloremes	Plastic variables	Texture colour
			Conceptual variables	Dimension Boundaries Vectoriality Implantation or position
		The second level of variables – syntactics		

Table 4-3 Visual grammar in this research: terms employed and their relationships

Plane	**Visual elements**			
	Planes	**properties**	**attributes**	**definitions of attributes**
Content plane	**Primary**	**point**	shape	
			scale	
			colour	
		line	thick	
			thin	
		colour	hue	purity
			shade	darkness (by mixing black)
			tint	lightness (by mixing white)
			value	brightness
	Secondary	**shape**	type	
			size	
			space	
			leveling and sharpening	
			similarities and differences	
		form	size	
			scale	
			colour	
			dimension	
			shape	
		space	spacing	
			third dimension	
			relative size and position	
			perspective	
		texture	size	
			scale	
			value	
		light	range	

<table>
<tr><th>Plane</th><th colspan="4">Visual elements</th></tr>
<tr><td rowspan="11"></td><td rowspan="11"></td><td rowspan="7"></td><td>colour</td><td></td></tr>
<tr><td>direction</td><td></td></tr>
<tr><td>intensity</td><td></td></tr>
<tr><td>placement</td><td></td></tr>
<tr><td>quality and quantity</td><td></td></tr>
<tr><td>motivation</td><td></td></tr>
<tr><td>purpose</td><td></td></tr>
<tr><td rowspan="4">sound</td><td>volume or dynamic</td><td></td></tr>
<tr><td>rhythm and metre</td><td></td></tr>
<tr><td>tempo</td><td>level or speed</td></tr>
<tr><td>form</td><td>random sequence of music</td></tr>
<tr><td>pitch</td><td>transposition</td></tr>
<tr><td rowspan="11">Expression plane</td><td colspan="2">Rules</td><td colspan="2" rowspan="11"></td></tr>
<tr><td rowspan="5">Visual rules</td><td>balance</td></tr>
<tr><td>emphasis</td></tr>
<tr><td>movement or rhythm</td></tr>
<tr><td>dynamics</td></tr>
<tr><td>perspectives</td></tr>
<tr><td rowspan="5">Syntactic rules</td><td>basic laws of visual perception</td></tr>
<tr><td>laws of grouping</td></tr>
<tr><td>principles of composition</td></tr>
<tr><td>principles of visual interaction</td></tr>
<tr><td>interactivity and game mechanics</td></tr>
</table>

4.1 Visual Semiotics and Visual Approaches

Eco's notion of aesthetic function and Saint-Martins' theory of the semiotics of visual language offer an overview of visual language in art; in contrast, the visual perception approach of Arnheim and Gestalt theory enable a details. Both approaches complement each other and can be combined and adapted to study visual language of digital games.

4.1.1 Eco's Theory of Semiotics

Semiotics is applied in many different fields: Eco (1979) notes nineteen – only one is of interest here; visual semiotics. Eco develops semiotics further to consider the functions of signs including their aesthetic values. He develops a theory of codes and a theory of sign production based on Pierce's semiotics concept and Jakobson's model of communication; in addition, he applies Hjelmslev's concept of treating signs as an entity. Eco noted that signs have two main components: expression-form and content-form; the two components are related by 'sign-function'. In his theory of semiotics, he splits the sign component into two parts: expression-plane and content-plane correlated with a rule of sign function which he calls Codes (1979: 48-150). He notes that 'A code is a system of signification, insofar as it couples present entities with absent units. When – on the basis of an underlying rule – something actually presented to the perception of the addressee stands for something else, there is signification ... A signification system is an autonomous semiotic construct that has an abstract mode of existence independent of any possible communicative act it makes possible' (1979; 8-9); Eco classifies signs into artificial and natural; natural signs are produced by things or events; artificial signs are produced by human agency and are divided into signs in order to signify and signs as functions (Guillemett and Cossette 2006).

Eco's aesthetics refers back to Jakobson's six functions: referential (contextual information), metalinguistic (self referential), emotive (self expression), conative (imperative addressing of receiver), phatic (of language) and aesthetic/poetic. Jakobson's six functions link up and overlap creating a single message from sender to addressee (recipient); one function characterises and dominates a message; the dominant function will vary from message to message. Eco was interested in only one of Jakobson's six functions, the aesthetic/poetic. The aesthetic function exists in literary texts and art. Nardi and others demonstrated that players are seduced firstly visual aesthetics of the game landscape; she described it as an 'aesthetic experience'. For experienced players, attraction to games lies more in its interactions; the aesthetic experience may be revived by entering a new landscape. Arguments about whether digital games are art were discussed in chapter 2; aesthetics is the sole consideration; art theory enables debate. Eco suggests that the addressee receives messages from and makes judgments on aesthetic texts; this is how he defines 'aesthetic experience'. In Eco's theory of sign production, an aesthetic text is an invention. Eco defines 'ambiguous' as violation of the code of signification (or system of signs), and 'stylistic' as a form of ambiguity in which the code of signification is violated, or is an example of overcoding. He says that 'some stylistic approaches to criticism (Spitzer 1931) speak of the aesthetic as a deviation from the norm. This not entirely satisfactory because not every deviation from the stylistic norm constitutes an aesthetic achievement: /Amant Paulum Petrus/ is semantically comprehensible and stylistically deviant but it sounds merely rather odd' (1979: 263). He notes that ambiguity is important because it initiates

the aesthetic experience. Eco assumes that ambiguity on the expression-plane matches ambiguity on the content-plane; in an aesthetic text, he suggests focusing on the lower level of the expression plane. He gives the example of an Italian palace; one should focus on the level of the architect's idea of the 'form' of the artifact and the whole set of geometrical rules of the drawings which the architect organised. He claims that 'in the aesthetic text the matter of the sign-vehicle becomes and aspect of the expression-form' (1979: 266).

Eco's concept of two planes provides us with the broad idea for the construction of aesthetic texts; he does not provide us with the codes but only a framework into which the codes can be inserted. The next section focuses on the lower level of the expression plane.

4.1.2 Semiotics of Visual Language

Linguistic theory has been adapted to provide a systematic, structural framework to study interaction because, like language, it is about communication. Linguistic theory is unsuitable for studying the site of the game. Saint-Martin established a functional and systematic visual language. She defined 'visual perception' as 'a sequence of visual movements of expansion and contraction'; even if you look at a painting, the eye will zoom in and out between the whole and parts. The sequence of visual movements organises the perceptual process, providing the basis for her visual grammar.

Saint-Martin wrote that '… paradoxically, the discovery of the fundamental units of visual language, which have evaded observers for a long time, could only be made once the system of internal relations of that language was known. Inversely, the potentialities of a system are determined by the structure of its elements' (Saint-Martin 1990: 1). She further suggests that, to develop a grammar of visual language, it is necessary to define the primary elements, their parameters and relationships. She took from Noam Chomsky the idea that 'A language is defined by giving its 'alphabet' (i.e. the finite set of symbols out of which its sentences are constructed) and its grammatical sentences' (1957: 21) and asked the question 'how can visual language possess an "alphabet" made up of "symbols" and constituting a "finite set"? And how would the "grammaticality" of a visual proposition be recognised? (1990: 2).

Saint-Martin names artists as 'visual speakers' who determine and use the basic elements of pictorial or sculptural language as minimal units to develop grammar leading to interrelations.

Investigation of visual language developed from aesthetics and art theory; Gestalt (a whole created from parts and parts leading to 'movement' between the whole and its parts) also provides a useful concept to contribute to the development of a visual

language. Gestalt concerns visual perception in a sequence of visual movements (Saint-Martin 1990). Saint-Martin mentions Thürleman as stating that the elements of 'a plastic phonology' have not yet been isolated' – 'plastic' in the sense that they can morph – to describe 'the first units of the plane of expression and their role in the constituting processes' – 'first units' being the most basic units. Saint-Martin states:

> *There have been many arguments about the difficulty of determining a small number of minimal units in painting that can act as an alphabet, following the model of the phonemes which serve in verbal language to constitute morphemes (or words) and which regroup to form propositions (1990: 3).*

Saint-Martin proposes to take the study of syntactic rules as being part of a grammar of visual language at the primary level, in which the basic elements are linked in a coherent system of complex units. In primary level are coherent and complex.

In the investigation of visual perception, Saint-Martin proposes a basic unit of visual language which he calls the 'coloreme':

> *A coloreme is defined … as the zone of the visual linguistics field correlated to the centration of the eyes. It is constituted by a mass of energetic matter presenting a given set of variables. This primary element of visual language is made up, from a semiotic point of view, of a cluster of visual variables, the properties of which will be described and elaborated upon … the coloreme is immediately structures as a topological region. Visual perception is realized through a positioning of the eye in the direction of the visual field, called an ocular centration or fixation. This fixation can obtain different visual information according to the specific mechanisms of vision it borrows: the fovea, the macula, or the peripheral vision (1990: 6).*

She clarifies how the coloreme – the basic unit of visual language – corresponds with the percept:

> *In regrouping a finite and specific ensemble of visual variables, the coloreme offers itself as an autonomous – and by its structure, a differentiated unity, constructed by perception. Its global characteristics are quite different from those of the individual variables that constitute it.*
> *When one variable is modified, the coloreme itself is entirely transformed along with its interrelations with other colorèmes. Visual variables themselves offer a wide potential for differentiation bit no single one among them can play the role of a basic element, since they are all inextricably bound up in any given percept (1990: 7).*

To analyse visual language, Saint-Martin suggests that it needs to be examined in relation to its visual variables which are transmitted by signs. The primary level of each concept is divided into two groups; the plastic variables group contains the variables of colour and texture; the conceptual variables group contains dimension; boundaries; vectoriality; and implantation or position in the plane. Saint-Martin describes the groups of plastic and perceptual variables as follows:

> *The first group formed by colour and texture, is more directly linked to the objective characteristics of coloured matter constituting the visual field: they are called plastic variables. The second group of visual variables, the product of a larger implication of subjective, mental processes in the synthesis effected on this material, are called perceptual variables (1990: 17.)*

Saint-Martin suggests that to formulate the grammar of visual language, we need to understand the syntactic rules to be able to investigate the operation of visual variables in the visual field. The syntactic rules and principles are used to organize and operate the visual variables. According to Saint-Martin, 'The syntactic rules of the visual language are constituted by the set of operations and functions through which perceptual mechanisms establish interrelations among the basic elements in diverse visual fields. Their application results in the construction of specific spatial totalities (1990: 65)'. The rules of visual grammar cannot be fixed because the visual variables are dynamic. Saint-Martin proposes a set of syntactic rules to govern grouping and regrouping of coloremes and change group function. (Saint-Martin's rules are confusing, for example by using the same term in two meanings or by using two terms for the same meaning; also, she uses 'level' in unrelated contexts.) Only those sections of Saint-Martin's rules which are relevant to this research will be discussed here.

Saint-Martin Lays down three sets (she calls them 'groups' but here this term is avoided because she also employs it to describe groups of coloremes) of rules for the grammar of the visual arts: painting, sculpture and architecture.

The three main rules (Saint-Martin 1990: 68) are:

1. The first rule [set of rules] describes the regrouping of coloremes in the visual field.
2. The second rule lays down 'the rules [sic] generated by the insertions of coloremes within the energetic infrastructure proper to each medium; that is, the Basic Plane for the pictorial, the Virtual Cube for the sculptural and its environmental extension for the environmental.'
3. The third rule is 'the modal rules [sic] that preside over effects of distance and which are inscribed in various codes or systems of perspectives.

The first and second rules will be discussed here insofar as they are relevant to this research. The third rule is not directly relevant to the research and will not be discussed here.

1. The first rule describes the regrouping of coloremes in the visual field. The rules depend on:
   (a) topological relations is not directly related to this research but needs to be taken into account when considering interrelations of coloremes from the point of viewing: 'This spatial model of the organization of perceptual experience remains throughout human life the basic means by which one constructs his notions of reality' Saint-Martin (1990: 68). There are two types of 'path' or interrelation between diverse points in the visual field: (i) locomotions which are the results of points of viewing at dynamic perceiver positions in the visual field (ii) communications which result from material energies in the visual environment.
   (b) gestaltian relations is the principle which Saint-Martin uses to describe the groupings of visual variables into coloremes employing gestalt theory; coloremes are grouped into visual objects employing gestalt theory and visual rules. Gestalt theory frames the rules of visual grammar; although 'gestalt' has already been defined in chapter 2, it is worth recapping. According to gestalt theory, the viewer of visual art, a painting for example, first takes a wide view of the whole work; this is followed by a close view of a coloreme; this process is repeated many times; in each repetition, the visual elements of the coloreme are regrouped. Saint-Martin's gestalt theory is a summary of Khöler's (1940); she adapted it to include gestaltian principles as part of visual language:
      (i) Principle of figure-ground relationships – 'the percept of distance in depth between the two regions (1990: 73)': the superimposition of a large or small figure in the foreground creates an illusion of space between the figure and the background.
      (ii) Principle of proximity – the 'proximity factor': objects in close visual proximity are perceived as forming groups of visual variables.
      (iii) Visual patterns – the groups of visual variables, or visual aggregates, in (ii) form patterns in relation to their positions and distance from each other and may produce a 'symmetrical totality', by which Saint-Martin means that similar patterns can be found in different areas of the visual field. The designer aims to produce such patterns, which are explained by gestalt theory, because the viewer's vision is naturally drawn to them, a phenomenon which Saint-Martin calls 'the iconic recognitive function'; this process is part of her analytical framework.
      (iv) Continuities – the viewer, in his visual field, is drawn to curves and angles, acute and obtuse; these 'continuities, create virtual curves.
      (v) Similarities – Some visual variables aggregate by shared characteristics. Any individual visual variable may belong to more

than one aggregate depending on the characteristics of the group; the most effective aggregated characteristic is colour. Visual variables may be similar but not identical.

(vi) Individuals' perceptions – a viewer brings habit, experience, knowledge and emotions to his or her interpretation of visual fields. Individuals have their own 'needs and abilities which affect their involvement with perceptual activities'. Although gestaltian principles 'may appear basic and universal, they are not necessarily made use of by every viewer'.

(c) The second rule – the laws of interaction of colour: colour interactions can create connections between distinct elements by dissolved boundaries; create new virtual forms; adjust dimension, position, etc. Saint-Martin's framework is too complicated to be of practical use in this research, but will be applied in a simplified form. The colour effects, from Saint-Martin, which are relevant to this research, are:

- equalization – the same colour employed in different visual fields
- colour contrast – some combinations of colours catch the eye immediately and stand out in contrast to neighbouring colours; conversely some colours are harder to distinguish and are not so noticeable in their surroundings
- optical mixture – adjacent colours (usually two), often in stripes, which give the illusion of a brighter colour

2. The second rule – 'the rules generated by insertions of coloremes within the energetic infrastructure proper to each visual medium; that is, the Basic Plane for the pictorial, the Virtual Cube for the sculptural and it environmental extension for the architectural (Saint-Martin 1990: 68).' This will be discussed in more detail later in this chapter.
3. The third rule – 'the modal rules that preside over the effects of distance and which are inscribed in various codes or systems of perspectives (Saint-Martin 1990: 68).' The third rule is not directly part of this research beyond awareness of it.

The syntactic rules of coloremes are common to different types of visual languages; each art has its own characteristics but they share some basic elements. Saint-Martin also pointed out that:

> *The various types of visual language(painting/photography, sculpture, architecture, etc.) do not differ by their use of visual variables that are common to all, but rather they are differentiated in their syntactic and semantic structure and by analytical hypotheses that have given them birth. These provide permanent and different infrastructures that we call the Basic Plane, in the case of painting or photography; the Virtual Cube, in the case of sculpture; and the environmental Cube. In architecture (Saint-Martin, 1990: 74).'*

In the semiotics of visual language, Saint-Martin investigates mainly the visual language of painting and sculpture. Saint-Martin defines painting as 'a surface of minimal thickness; visual elements are embedded on the limited frontal plane; she later adopted the term 'Basic Plane' form Kandinsky (1962) to describe any two-dimensional representation. Kandinsky uses his concept of the Basic Plane to investigate the basic elements of pictorial discourse: point, line and colour whilst gestaltian psychology is concerned primarily with the whole rather than the parts. Saint-Martin defines 'Basic Plane' in her framework as follows:

> The structures of this Basic Plane establish a group of coordinates which generate a particular relation of signifier/signified, analogous to those syntactic structures with which one might compose when attempting to represent and convey meaning in any existing natural language (Saint-Martin 1990: 78)

Saint-Martin further defines sculpture as real three-dimensionality which the eyes can perceive and synthesise through visual percepts. Saint-Martin adopts Edward T.: Hall's idea that 'depth is a hidden dimension' (1977: 115). From Herbert Read she took the idea of tri-dimensional mass: people see objects from numerous view points and preserve the mnemonic images to construct a tri-dimensional image. Developing these ideas, she claimed that 'the eye cannot perceive a 'volume' in any one centration but has to multiply its positions and angles and establish relations between them in order to "reconstruct" the notion of the "invisible" internal volume any horizontally-sighted perspective, the eye cannot perceive, the eye cannot perceive volumes as such, but rather a semi-volume or a semi-relief on the background plane. (Saint-Martin 1990: 147). Saint-Martin treats the elements of sculpture in the same way as she does for any other visual media and explains how, on larger planes, coloremes regroup, regulated by the basic syntactic rules. The syntactical rules of sculpture are the same as for painting apart from two additional rules:

4. The fourth rule – describes how the Virtual Cube (a series of Basic Planes) shares the semantics and syntax of sculpture (three dimensions).
5. The fifth rule – describes how sculpture and the Virtual Cube represent natural and fictional perspectives respectively.

Saint-Martin's 'Virtual Cube' is a means of representing a three-dimensional object using only Basic Planes; one reason for doing this is to enable the study of a sculpture from all viewpoints simultaneously, enabling comparisons of details in the sculpture which might otherwise be problematical. This is stated by Saint-Martin, but in rather convoluted language which has to be decoded the extract a simple idea: "The Virtual Cube also offers a basic volumetric structure, corresponding to a topological three-dimensional mass and according to which the potential and synthetic volumetrics of the structures can be constructed (Saint-Martin 1990: 173).

We might question the reduction of sculptural surfaces into the Virtual Cube while the viewer naturally seeks views from multiple angles and both close-up and overall views. Saint-Martin pointed out that the Basic Planes can be rotated into any position to give viewpoints of any angle. She noted that 'The syntactic structure of the virtual cube serves only as a theoretical parameter with a view to the integration of these multiple faces and their respective depths in a synthesis where their differences can still be recognised (Saint –Martin 1990: 181). The multiple viewpoints of the viewer are responses of the viewer's own body in the dynamics of perception; therefore, viewers have to place themselves in positions which relate to the Virtual cube where they can interact with the sculpture; viewers can choose their own viewing positions investigate the sculpture; the viewer is not restricted to the sculptor's intentions regarding viewpoints (1990: 181).

4.1.2.1. Semiotic Analysis

In art, 'centration' is the location which most strongly attracts the viewer; even if the viewer looks away, he or she will always be drawn back to that location; centration is the choice the artist although it is possible for the viewer to have a different centration. Saint-Martin took Hjelmslev's idea of homogeneity and applied it to semiotic analysis of visual language with two components: 'homogeneity' and 'continuity'; these concepts can be used to classify visual objects in terms of similarities and differences at the centration of the dynamic/visual field. This means that the centration may differ from the rest of the work in being lighter or darker; having a different colour or shape.; or differ in; some other characteristics; similarities can also create a centration; lines, curves and shapes, perhaps a road or river can lead the viewer to the centration; a work of art is a dynamic system interpreted by the visual objects. According to Saint-Martin, semiotic analysis filtered through viewers' perspectives is empirical; and can be judged by criteria such as viewers' reactions: for example surprise, interest, pleasure or distaste.

Saint-Martin describes semiotic analysis as the process of the viewer interpreting objects in two ways: colormatic and syntactic. The colormatic, or exploratory analysis is phonological; it studies coloremes – the basic units or first level, of visual language.

The second level is sytnactic: it examines the regrouping of coloremes into ensembles using the syntactic operators of visual language. The laws of perception are invoked to study the interrelation of visual elements and the regrouping of coloremes through topological and gesataltian harmony (1990: 193). Visual variables combine and recombine to form coloremes in the Basic Plane; their organization and function are dynamic and are influenced by possibiolity of expansion; potential for junction or disjunction; vectoriality; etc. Saint-Martin places a grid on the Basic Plane identify and locate coloremes. Syntactic operators are required to analyse coloremes both internally (the coloremes themselves) and

externally (audience experience). The first level of analysis is performed at coloreme level (internal) and the second level is of the syntactic structures (external) (1990: 194-200).

4.1.2.2 Visual syntactic analysis

Saint-Martin describes the syntactic analysis of visual language as 'operative analyses' – the applications and functions of syntactic rules, especially the topological and gestaltian perceptual operators to reveal junctions and disjunctions between agglomerates of coloremes. Saint-Martin noted that syntactic analysis works on two fundamental levels: two-dimensional by grouping and separations; and three dimensional illusion of depth. Saint- Saint-Martin proposed fundamental steps to conduct syntactic, semiological analysis of visual representation; only those which are directly relevant to this research are considered here with explanations as to how they will be applied:

(i) Differentiation of the visual field into regions … (Saint-Martin 1990: 204)
This will be applied to classify the visual elements and group the game objects.

(ii) Description of regions according to their preponderant visual variables …
Define the game objects according to their properties.

(iii) IV Establishment of gestaltian interrelations between each region and recognition of gestaltian groupings endowed with an iconic function; pressure of the 'good form', figure/ground productions, and so on.
Define the syntactic rules of groupings

(iv) V Recognition of the main subregions in each region and description of their internal/external structures.
Define and classify the game territories and sub-territories.

(v) IX Recognition among regions and subregions of the arrangements of visual variables linked to the structural spatialisation of various organic spaces.
Define the relationships between visual elements, game territories and sub-territiories.

Gestaltian mechanisms are applied in syntactic analysis to regroup coloremes in a region by junction/disjunction. Junction/disjunction can connect and disconnect coloremes in pictorial planes and be used later to establish the correlations between factors such as proximity, similarity and complementarity; these three factors produce different effects in each region; proximity accentuates distance and heterogeneity; similarity accentuates visual movements through the syntax of colour, texture, boundary, orientation, angularity, vectoriality or form.

Saint-Martin tries to lay down the visual grammar of artifacts, paintings, sculpture and architecture through semiotics. She concentrates on the primary level of variables (coloremes) to construct the syntactic rules of visual variables. She chose painting to stand for all two-dimensional art in the Basic Plane; and sculpture for all

three-dimensional art in the Virtual Cube. She ignores the viewer, participation and perceptions.

World of Warcraft imitates the real world combined with mythology, fantasy and science fiction; the game environment is three-dimensional even though projected onto a two-dimensional screen. Basic art forms are used to assemble primitive objects (for example cones, cylinders, cubes, etc.) in 3D software; primitive objects are used to assemble more complicated objects (buildings, avatars, scenery, clothes, etc.) which provide the entire visual composition of the game. The created world is not intended to be realistic; objects may not be on the same scale as in the real world and the colours a more vivid. Texture and decoration are designed to narrate stories and place them in a mythological world. The Basic Plane and Visual Cube offer a valuable framework for the study of visual grammar in WoW.

Art theory will be employed in the next section. Arnheim's visual perception and gestalt theories will be applied to Saint-Martin's second level of visual variables (syntactical). This dual approach will help us investigate visual variables and their composition. Composition embraces organization of and relationships between visual objects to create complexity.

4.1.3 Art and Visual Perception

Rudolf Arnheim is a pioneer of the study of visual perception. His book, 'Art and Visual Perception: A Psychology of the Creative Eye' (1974), he proposed a visual approach to interpret art objects, concentrating mainly on painting, drawing and sculpture. He developed his visual conceptual framework from psychological and aesthetic analyses of films; additionally, he applied gestalt theory to the psychological aspects.

Each component has various operators governing the basic art forms. Arnheim claims that people perceive a work of art through the immediacy of their senses and feelings; visual objects cannot be conveyed by language. He notes:

> *Visual experience is dynamic. ... What a person sees is not only an arrangement of objects, of colours and sizes. It is, perhaps first of all, interplay of directed tensions. The tensions are not something the observer adds, for reasons of his own, to static images. Rather, these tensions are as inherent in any percept as size, shape, location, or color. Because they have magnitude and direction, these tensions can be describes as psychological "forces" (Arnheim 1974;:11).*

His conceptual framework consists of ten principal components:

(a) Balance
(b) Shape
(c) Form
(d) Growth (not applied in this research)

(e) Space
(f) Light (not applied in this research)
(g) Colour
(h) Movement
(i) Dynamics
(j) Expression

The seven components adopted for this research because they are useful for the interpretation of visual artifacts. Each of the seven remaining components needs to be discussed in terms of the following questions: What are their properties? How do they function? How are they connected?

(i) Balance

Generally, in an object, there is a balance of psychological forces which pull in opposite directions – equal forces balance. By balanced composition, Arnheim meant that all factors affecting visual balance – shape, direction, location, size, colour, etc. – seem to be stable and necessary for the whole; conversely, disequilibrium tends to be transitory. Balance is required to preserve the unity of the whole. Symmetry in at least one Basic plane is a prerequisite for balance but not in all Basic Planes.

Weight of visual objects is different from weight in physics: a product of gravitational force on a mass. Arnheim identifies seven elements which compose visual weight:

a) Location
b) Spatial depth
c) Size
d) Intrinsic interest (because of the subject matter)
e) Isolation
f) Shape
g) Knowledge and experience

Visual weight decreases with distance from the centre of the Basic Plane; isolation and larger size, likewise, increase visual weight; viewers, additionally, draw on their own experience and their knowledge including the comparative physical weights of different objects – heavier objects possess greater visual weight.

Visual direction derives from composition; certain arrangements and organization of objects and their shapes lead the eye in certain directions. Some manifestations of direction are obvious, for example along a road or river or valley or through an opening; others are not so obvious. The direction in which the eye is led is said to be created by visual forces. Normally, if a force in the visual field acts in a particular direction, another force will act in the opposite direction to balance it. Arnheim explains:

> Weight through colour may be counteracted by weight through location. The direction of shape may be balanced by movement toward a center of attraction. The complexity of these relations contributes greatly to the liveliness of a work (Arnheim 1974: 28).

Balance can be created by other distinctive factors, which need not be visual, such as events within the simultaneous narrative (Arnheim 1974: 10-41).

(ii) Shape

According to Arnheim, a visual shape is an object with boundaries; we perceive objects with the whole of our previous visual experience. He notes that visual experience is implanted with specific content of space and time; perception of objects is influenced by adjacent objects. A visual shape is perceived in relation to time and space. Arnheim describes the process of perception: objects are constructed and present themselves through perceptual organization; then, the shape of other objects at different times – past and present – yields to the effect of shape interaction with nearby objects and those of our past experience; during this process, the shape behaves like an animated object, changing shape, size and position. The principal operators which define shape are:

(a) Simplicity – a shape which is easy to understand
(b) Simplification demonstrated – when first viewed indistinct or unclear shapes are often interpreted as simple shapes.
(c) Leveling and sharpening – opposite tendencies; leveling is the tendency to reduction of complex shapes to simpler forms and elimination of detail; sharpening enhances differences and stresses angularity. Arnheim describes 'leveling and sharpening thus: 'Leveling is characterized by such devices as unification, enhancement of symmetry, reduction of structural features, repetition, dropping of nonfitting detail, elimination of obliqueness. Sharpening enhances differences, stresses obliqueness (Arnheim 1974, 67).
(d) Similarity and differences – likewise opposite operators: they sort and separate visual objects by comparison in cooperation with other percepts such as size, colour, spatial operation, brightness, etc.

(iii) Form

Arnheim makes the point that "… we see every shape as a kind of shape.' He continues '… each kind of shape is seen as the form of whole kinds of objects'; or, form is a kind of shape; form represents objects. Experience and context are required to interpret forms to give them meaning. Context provides orientation to understand the 'frame of reference' of objects, i.e. the full range of meanings of the object within its context; the frame of reference is vital to interpretation and understanding. People interpret objects through orientation; gravitational force is a universal frame of reference allowing the frame to recorded on basic axes on the Basic Plane – Arnheim calls it 'retinal orientation'. Arnheim give the example of

how humans and animals turn their heads to look at an upside-down object such as a painting.

(iv) Space

A visual representation of space is perceived when objects are placed in different positions relative to each other within the Basic Plane or Virtual Cube. The relative positions establish the depth of spatial dimension. Arnheim notes about the depth of space that:

> *As we look at the physical world, the three-dimensionality of vision seems to offer no problem – until we recall that the optic input for all our visual experience consists in two-dimensional projection on the retina. This does not mean that visual experience is primarily two-dimensional …*
>
> *The basic principle of depth perception derives from the law of simplicity and indicates that a pattern will appear three-dimensional when it can be seen as the projection of a three dimensional situation that is structurally simpler than the two-dimensional one (Arnheim 1974; 247-248).*

In the Basic Plane, Arnheim argues that visual depth of space is created by various manipulations such as overlapping, transparency, deformations and gradients. Overlapping or superimposition is one means of creating the illusion of depth. Objects are arranges so that one object is partly superimposed on another, so that the partly concealed object appear further away than the one on top. "A special case of superimposition is transparency (Arnheim 1974; 253).' Objects overlap or are superimposed but still remain visible or partly visible. Deformations create depth of space by distorting the perceived 'reality' of visual objects in terms of size, shapes, spatial distance and angles.

(v) Movement

Arnheim (1974: 372) defined 'movement' as 'a change in the condition of the environment'. He uses binary oppositions to describe change: 'things and happening'; 'mobility and immobility'; 'time and timeless'; and 'being and becoming'. He breaks down the visual experience of movement into three categories: physical, optical and perceptual; additionally, he adds 'kinesthetic factors, which can produce the sensation of motion all by themselves under certain conditions, e.g., by vertigo.' 'Physical movement' refers to movement of objects. Arnheim restricts his definition of 'physical movement' to movement observed by the viewer and excludes any unnoticed movement. By 'optical movement', Arnheim means that 'the projections of objects and visual fields are displaced on the retina'; to be relevant to this research, we can expand Arnheim's 'optical movement' to incorporate camera movement in a film and changes in the viewpoint in games. Arnheim proposes two dimensions to movement: direction and speed.

> *'As longs as the dominant framework stands still, any immobile object is perceived as being "outside time," just as the framework itself is. A moving framework, however, imparts action to the whole setting and the objects it contains, and it can translate timeless into active resistance to motion. Just as a rock in the middle of a rushing stream exhibits stubborn opposition to motion, so a person standing still in a surrounding stream of walking or running people will not be perceived as outside the dimension of motion, but will appear, in terms of motion, as arrested, petrified, resistant (Arnheim,1974:381-382).'*

(vi) Dynamics

Dynamics is a fundamental aspect of visual movement. 'Visual perception consists in the experiencing of visual forces (Arnheim 1974: 412).' Visual forces are always present in the sense of motion in visual objects. 'Motion' or 'movement' are terms to describe visual dynamics driven by visual forces. Arnheim uses the term 'tension' to mean 'tendency to move'; that is, for Arnheim, 'tension' and 'force' are the same; in this research 'force' is employed to the exclusion of 'tension'. He suggests that visual direction is an essential component for a sense of movement and tension (i.e. force) in visual dynamic objects. He further suggests that 'directed tension' is present in other visual variables, such as shapes, colours, and locomotion (the ability to move). Various aspects of movement – motion, shortening, expansion, growth – form the visual dynamics of objects. In art or design, Arnheim proposes that visual dynamics can be observed through changes in shape, orientation and position. Applying directed tensions to visual elements, he suggests focusing on a single element – point, line, shape, colour, etc. – rather than a complex pattern. All dynamic components of visual elements are required and work together in a visual artwork:

> *The dynamics of a composition will be successful only when the "movement" of each detail fits logically in the movement of the whole. The work of art is organized around a dominant dynamic theme, from which movement radiates throughout the entire area. (Arnheim 1974:432).*

For this reason, no dynamic component can be excluded from visual experience. Arnheim points out that the visual dynamics does not belong to the physical world but are processed by the brain from retinal projection to accumulate visual experience. Confusion arises in the discussion of visual art because much of the nomenclature derives from scientific disciplines, especially Physics.

(vii) Expression

Dynamic qualities such as motion, expansion and contraction are experienced through visual perceptions. Visual perception is one way by which we define objects. Arnheim defines 'expression' as 'behaviour displayed in the dynamic appearance of perceptual objects or events (1974:445). He also claims that

countenance, gesture and posture are manifestations of an expressive mind. Thoughts may also be expressed by actions such as talking, walking, etc. To explain 'expression' further, Arnheim applies Lipps' Theory of Empathy to explain how people project their own kinesthetic feelings onto objects with which they are familiar from past experience. When confronted with a new object, people draw on experience to recall objects with similar characteristics. Interpretation of visual objects depends on recall of both conscious and subconscious memories:

> *The human mind receives, shapes, and interprets its image of the outer world with all its conscious and unconscious powers, and the realm of the unconscious could never enter our experience without the reflection of perceivable things. There is no way of presenting the one without the other. (Arnheim1974:461)*

Through his principles of visual perception, Arnheim establishes the visual analytical principles not only for art but for all visual media. To conduct this research, Arnheim's framework will be divided into two levels:

(a) Lower Level – the Lower Level is made up of basic visual elements: point, line, shape, form, color, space, texture, light, sound.
(b) Higher Level – the Higher Level lays out the visual principles to organize and operate the lower level to investigate the game environment. Arnheim concentrates on two-dimensional imagery; the Higher level will be expanded to incorporate the third dimension. Arnheim's work need to be augmented for this research to include interaction between: audience and object; audience and audience; and audience and sound; and audience response to the game. Saint-Martin's visual semiotic theory and Gestalt theory will fill these gaps.

4.1.4 Gestalt Theory

Gestalt theory is much employed by artists and scholars who are interested perception including Arnheim; they use it to develop their own theories and applications. 'Gestalt' is a German term meaning 'pattern', 'form', 'shape' and 'configuration' (Rock & Palmer 1990; Mann: 2010). Gestault theory was invented by Max Wertheimer, Wolfgang Köhler, Kurt Koffka and others starting in 1912, and further developed by others, e.g. Edgar Rubin. Some of the original principles of Gestalt theory can be integrated with other approaches in the initial analytical framework to investigate the site of the game. These principles, which organize the visual system, are:

(a) People perceive a work of art as a whole configuration, not only the sum of its parts.
(b) The whole configuration is formed by organizing the visual system through the laws of grouping. Grouping exists when the viewer perceives proximity of objects in three dimensions.

(c) 'Connectedness ['joinings'; 'junctionres'] refers to the powerful tendency of the visual system to perceive any uniform, connected region as a spot, line or more extended area – as a single unit.'
(d) Proximity, similarity, enclosure (sometimes incorrectly called 'closure') and continuation (links or connections) characterise the laws of grouping. (Rock & Palmer 1990)

Game designers create the system of visual elements in WoW including visual objects and environment; this process is reversed by applying gestalt theory within the analytical framework. Gestalt theory can be applied within Arnheim's Lower Level. In WoW the signs are not independent but are part of a complex semiotic system, connecting to other components of the game and linking the real and virtual worlds.

4.1.5 Semiotic Properties and Interrelation

Many scholars are interested in the semiotics of visual arts; they concentrate three main areas: semantic, syntactic and pragmatic. Omar Calabrese, for example, studies the representation of bridges in painting; his work is relevant to the study of meanings in art generally. He describes bridges as motifs: 'We shall analyze a group of pictures that represent that object of the natural world we call 'bridge'.' He concluded that the functions of a bridge in art are:

(a) 'The representation of a bridge 'translates', or is the illustration of, a literary plot." He describes this as the 'more trivial case' (of (a) and (b)).
(b) 'The bridge fulfils the function of connecting two separated wholes (for instance: territories, groups of men, and so on) …' He describes this as more descriptive' than (a) 'but still concerns the organization of content.'
(c) Narrative syntax: 'the different episodes of the tale are connected by the means of a bridge.'
(d) 'Syntax in painting is not only narrative …'; it may be 'formal', by which Calabrese means that it, the bridge, serves a visual compositional function separating and connecting visual elements.
(e) Calbrese talks about 'a final frontier, the so-called 'aesthetic frontier'; there are two spaces: the 'space of representation' and the 'space of the spectator' with a 'threshold between the two spaces; the bridge crosses the threshold linking representation and spectator.

Calabrese suggests employing Greimas's concept: 'a text is structured on three superimposed levels (discourse, narration, deep semantic level)' to explain 'connection' in internal structures (within the work of art). The three superimposed levels can focus respectively on the relationship between text and reader; the narrative structure of architecture; and the interpretation of meanings at the deepest structural levels (Calabrese 2011).

The concept of bridges opens up investigation of connections between semiotic modes such as narrative and imagery; it can be applied to the intercalation between two sites of the game – the site of the game and the site of the player – which will be discussed in chapters 6 and 7.

Part II: The Theoretical Foundations to Analyse Player Perception

The two main theoretical frameworks employed to analyse player perception in this research are:

1) Multimodal discourse analysis – Multimodal analysis in this research is integrated into a single framework drawing on the modes of analysis of:
   i. Images – Kress and Van Leeuwen (2006)
   ii. Speech, music and sound – Van Leeuwen (1999)
   iii. Movement and gesture – Martinec (1998, 2000)
2) Social Semiotics – mainly derived from Holidays' systemic functional grammar which is employed to analyse the interaction game and player.

The theory will be reviewed starting with and building of its foundations.

4.2 The foundation of Semiotics and Social Semiotics

The objective of this research is to develop a theoretical and analytical framework for visual grammar in digital games; the history of semiotics is discussed with this aim in mind. 'Semiotics' derives from 'semeiotics' which in turn comes from the Greek *σημειωτικός*, (*sēmeiōtikos*), meaning 'of signs'; the Oxford dictionary has 'sēmeioun' meaning 'to interpret as a sign'. Aristotle (384-322 BC) proposed a concept in three parts for art interpretation: artwork, artist and consumer. Artwork itself is further divided into three components: Poiesis artist input; Mimesis – artwork expression; and Catharsis – artwork effect; these components later became the basis for the study of the structure of semiotics (Kenyon 1909; Sebeok 2001); they are still important today for the media and public response to the media. John Locke (1690)coined 'semeiotike', meaning the doctrine of signs. Gottfried Wilhelm Leibniz, the German philosopher and mathematician contributed to semiotics: 'A sign is a perception which permits the conclusion of the existence of a nonperception. A sign can stand for a thing (res) or an idea (conceptio, idea, cogatatio)'; he separated verbal and visual signs and considered semiotics to be the study of visual signs only; he defines signs as 'characters' or 'visible marks' which represent concepts (Noh 1990;22). Leibniz proposed elements for sign study: 'single elements' (ars characteristica); combined elements (rationales kalkül); 'application and creative use of sign combinations' (ars vivendi) (B. Hardt 2010).

From the 19th century, 'semiotics is considered, broadly, to be the study of signs and sign systems, marking the beginnings of linguistics we know it now. Ferdinand de Saussure was an early pioneer of Linguistics, applying semiotics to structural linguistics; his study of signs was concerned with 'the life of signs within society'

(de Saussure 1916). Culler (1982) translated de Saussure's 'Course in General Linguistics'; this is a summary from the introduction:

> *'(1) Langue and Parole, language is study of the relation between language as a system (la langue) and the actual manifestations of language in speech and writing (la parole)'.*
> *'(2) The Linguistic Sign, the sign is the combination of a signifier, which is a phonological sequence or 'sound image', and a signified or concept, which in parole are manifested as sounds and as meanings and references. Moreover, the relationship between signifier and signified is arbitrary'.(Saussure, 1974: xvii-xviii)*
> *'(3) Relation, to analysis the sign, linguistic units – units of the language as system- must be defined in formal, differential terms. The identity of two instances of a linguistic unit is not one of substance but of form […] The two principle types of relations are the syntagmatic (relations with other items in a linguistic sequence) and the associative (now generally paradigmatic: contrasts with items which might replace it in a sequence)'.*
> *'(4) Synchronic and Diachronic, the synchronic study of a language is an attempt to reconstruct the system as a functional whole. The diachronic study of language is an attempt to trace its historical evolution through various stages'.(Saussure, 1974: xix-xx)*

In his Course in General Linguistics, de Saussure notes in the chapter headed 'Nature of the Linguistic sign', that 'the linguistic sign unites, not a thing and a name, but a concept and sound-image. The latter is not the material Sound, a purely physical thing, but the psychological imprint of the sound, the impression that it makes on our senses' *(de Saussure, 1959: 66).* The linguistic sign, therefore, consists of two entities: concept and sound image. Later, he coined 'sign' ('signe') to represent all entities, and 'signified' ('signifié') 'signifier' ('signifiant') to represent concept and sound image respectively. He first establishes the nature of a sign: 'the linguistic sign is arbitrary' and 'language is a system of arbitrary signs and lacks the necessary basis, the solid ground for discussion' (de Saussure 1959:73). This is the immutability of the sign. He gives the example of the word 'sister' which does not have any relation with the semiotics of the sound 'soeur' in French; this is in contradiction to a system of symbols that have a rational relationship with whatever the symbol signified. Regarding the nature of the sign de Saussure notes further that is not governed by any rules except its own traditional law. Secondly, when signifiers become auditory, they represent a single 'dimension', they are tied down by a chain of elements; for example the interpretation of a word in a sentence is restricted in function and meaning by all the other words in the chain or sentence. Visual signifiers, in contrast, can be formed by simultaneous combinations in numerous dimensions. To structure language, a multiplicity of signs must be employed and to some extent, logic. For de Saussure, a system of signs is constituted by language and becomes a complex mechanism for use in daily life. As de Saussure said, 'Of all social institutions, language is the least amenable to initiative'. It blends with the life of society, and

the latter, inert by nature, is a prime conservative force (se Saussure 1959:74); by force, the social force associated with time is one of the features which check language apart from the weight of collectivity – the norms of society at a particular time.

Signs can be mutable or immutable over time. Regarding the mutability of the sign, de Saussure claims that forces of change have consequences for 'the relationship of the signified and the signifier. The signifier can change in both material aspect and grammatical forms; language cannot protect itself from the force of change. Signs are regularized by society through both continuity and change over time as de Saussure illustrates in figure 4-1. De Saussure describes the relationships between time, community of speakers and language:

> *Language is no longer free, for time will allow the social forces at work on it to carry out their effects. This brings us back to the principle of continuity, which cancels freedom. But continuity necessarily implies change, varying degrees of shifts in the relationship between the signified and the signifier (de Saussure 1959: 78).*

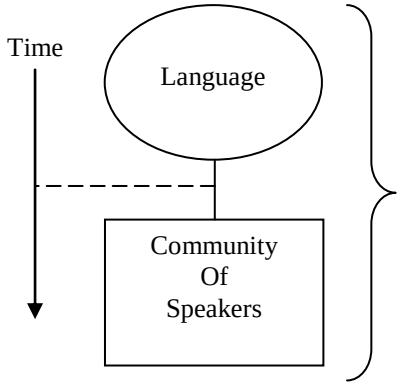

Figure 4-1 The sign concept to indicate passage of time (de Saussure, 1959: 78)

Working at a similar time to de Saussure, Charles Sanders Peirce (1839-1914), an American philosopher, coined the term 'semiotics' or 'semiotic' which he defined as 'the theory of sign relations'. His three basic semiotic elements were 'sign', 'object' and 'interpretation'; they form the basis for logic in semiotics. For Peirce, every sign, in language (Jappy 2013) or images, is an 'interpretant' (the sense made of the sign (Peirce 1931-1958)) in a chain; the interpretant's meaning is derived from earlier in the chain and influences meanings later in the chain. Peirce recognizes three types of sign:

(i) Icon/iconic – 'An *icon* is a sign that is made to resemble, simulate, or reproduce its referent in some way' (Sebeok 1994). Examples are cartoons, scale models, portraits, sound effects, gestures and metaphors.

(ii) Index/indexical – 'An *index* is a sign that refers to something or someone in terms of its existence or location in time or space, or in relation to something or someone else' (Sebeok 1994). Examples are 'natural sign (smoke, thunder, footprints), medical symptoms (pain, a rash, pulse rate), measuring instruments (weathercock, thermometer, clock), 'signals'(a knock on the door, phone ringing), recordings (a photograph, video or television shot).

(iii) Symbol/symbolic – A *symbol* is a sign that stands for its referant in an arbitrary, conventional way' (Sebeok 1994). Examples are language in general (plus specific languages, alphabets, punctuation marks), numbers and traffic lights.

Peirce adds that the 'sign' is independent of psychological subject matter and is not only linguistic. Initially, Peirce concentrated more on philosophical logic than linguistics or social studies, developed on a mathematical basis. Charles W. Morris (1938), another philosopher, worked on Peirce's semiotic concept and defined it as 'the science of signs'. He focuses on the processes and relationships of signs in three dimensions:

(i) Semantics – relation between sign and vehicle
(ii) Syntactic – relation between sign and representation
(iii) Pragmatics – relation between sign and interpreter

Pierce devised his semiotic theory as a form of logic whereas Saussure's semiology derives from linguistics.

The Russian philosopher, Roman Jakobson also contributed to semiotics; his concept was that the structure of language supports its basic function of communication. He combines structure and function in language, developing into a structural-functional theory of phonology on the basis of markedness (standing out) in a hierarchy of distinctive features. He identifies six factors which affect communication (see table 4-4).

Table 4-4 Six factors of communication

Factor	Function	
context	referential:	context
addresser	emotive:	self-expression
addressee	conative:	desire or will to perform an action
contact	phatic:	general social interaction
code	metalingua:	operation of the code
message	poetic:	message content

Saussure and Jakobson influenced Jan Mukařovský (1975-1981) who applied structural linguistics to arts and poetics (literary theory) in his books 'Aesthetic Function, Norm and Value as Social Facts (1936)' and 'Structure, Sign and Function (1978)'. He noted that 'poetic language' (Jakobson's term) works as one of the functional languages**.** Poetic language consists of expressed content and linguistic expression. Poetic language is affected by other functions including the aesthetic (see table 4-4).

Another founder of semiotics is Hjelmslev (1899-1965); he contributed the theory of glossematics – the most basic unit of language is the 'glosseme', similar to the 'phoneme' – which was an influence later on general semiotics. He uses semiotics in a broad sense to include literature, art, music, etc. 'Hjelmslev defined semiology as a *metalanguage* of semiotic systems … (Nöth 1990:66). De Saussure divides a sign into 'signifier' and 'signified' and distinguishes between form and substance; Hjelmslev substituted 'expression plane' and the 'content plane' for 'signifier' and 'signified'. 'Expression plane' ('signifier') and 'content-plane' ('signified'), when combined, are assigned to one of four strata: 'expression-form', 'expression-substance', 'content-form' and 'content-substance' – 'expression-form' and 'content-form' are equivalent to de Saussure's 'form' and 'expression-substance' and 'content-substance' to his 'substance'. Hjelmslev, however, applied the two forms – content and expression – to analyse sign function.

Some philosophers have applied semiotics to study art language, for example Nelson Goodman in his book 'Language of Art: An approach to the theory of symbols (1968).' He concentrates on aesthetic analysis; his term reference encompasses two components: 'denotation' – the relation between a sign and what it represents; and 'exemplification' – referring to a typical example. For Goodman, art is a language. Goodman employs symbol systems as grammar in the language

of art. The language of art has two sets of rules: syntactic and semantic (Goodman 1976). Goodman's language of art is not employed directly in this research but his syntactic rules are useful. He emphasized that arts are composed of systems of symbols; therefore, arts require interpretation in different modes according to 'what they refer to, in which way and in within which systems of rules (Giovannelli 2010)'.

Some semiotic frameworks are traditional and defined by their semiotic functions which provide different perspectives. Michael B. Hardt (2010) notes that Aristotle, in his 'Poetics', lays down three semiotic classes. Aristotle's classification developed into three main sets; see table 4-5.

Table 4-5 Comparison of Aristotle's and modern semiotic classifications

Aristotle's Classification		**Relationship between classifications**	**Modern classification**	
Poiesis	subjective input	directly related	**Semantic**	the sign in relation to meaning
Mimesis	art production	unrelated	**Syntactic**	the sign in relation to other signs (context)
Katharsis	effect, public perception	directly related	**Pragmatic**	the sign in relation to its origins and effect on the viewer

Modern classification concentrates on meaning (semantic), sign relationships (syntactic) and the viewer (pragmatic). Hardt compares communication of signs in Aristotle, Leibnitz, Pierce and Morris; here, Eco has been added for usefulness to this research (see table 4-6). The classifications of the original researchers are grouped by function: 'meaning', 'relation' and 'effect' which he calls, respectively, 'orientation', 'information' and 'inspiration'.

Table 4-6 Hardt's Comparison of Classification of Sign Functions with addition of Eco and terms used in this research

Hardt	Orientation	Information	Inspiration	Comments
Aristotle 384-322 BC	**Onoma** – the designation of a thing (word)	**Rhema** – the sign in a context (sentence)	**Logos** – a complex sign system (speech)	
Leibniz 1646-1716	**Ars characteristic** – the single element	**Rationales Kalkü** –the combination of signs	**Ars Vivendi** – creative use of sign combinations	
Pierce 1839-1914	**The rhema** – the single expression	**The dicent** – the sentence	**The argument** – the complex thought (syllogism)	
Morris 1901-1979	**Semantic** – the sign in relation to what it means	**Syntactic** – the sign in context with other signs	**Pragmatic** – the sign in relation to its origins, the effect on the viewer and the use one makes of it	
Eco b1932	**Semantic codes** – the significant units of architecture	**Syntactic codes** – spatial type	**Technical codes** – structural aspects of architecture	Addition – not part of Hardt's classification
Hardt b 1951	**Orientation** – sign units and relation with meaning	**Information** – signs and relation with context	**Inspiration** – sign systems and effect of viewer	
Terms used in this research	**Visual elements** – unit of visual signs	**Visual rules or Syntactic rules** – rules to organize visual elements	**Players' visual perception or interpretation** – effects on the player	

Umberto Eco developed his semiotic concepts in the context of art and architecture. Eco looks upon architectural design as a producing process which intends 'to permit the fulfillment of some function with life in society (Eco 1980).' Incorporating Eco into Hardt's comparison demonstrates that Eco's concepts are essentially traditional. Eco's framework focuses on signs by examining the organization of the sub-units of the sign in architecture; relationships between signs within contexts (the relation of architectural units which create spaces); and the effect of signs on the individual (construction and participants).

Most traditional semiotic theories concentrate on signs, relationships of signs and the context of signs in language. Later semioticians, like Eco, applied it to art, photography, film, architecture, etc.; study of semiotics in the arts has concentrated on the relation between the signs produced and meaning and did not take social factors, especially interaction, much into account. Social interaction is an important part of digital gameplay; to introduce social interaction in to the study of gameplay requires new analytical approaches.

Michael Halliday is the originator of social semiotics theory as an aspect of linguistic structure. He looks at language as a systematic resource for meaning and combines it with the social content. Language in social systems affects values and beliefs. Halliday wrote that language is the 'creature and creator of human society (2002)'; in other words, society shapes language and language shapes society. His work is guided by four tenets:

(i) He focuses on social semiotics.
(ii) In a language system, meaning is organised according to three functions of metalanguage: ideational, experimental and interpersonal.
(iii) His work has a semiotic foundation: signs, systems and meanings.
(iv) The two axes of chain and choice locate relations of the sytagmatic and paradigmatic language (Stenglin 2004:35); 'sytagmatic' means 'combinations of words according to the rules of a language' (Oxford Dictionary online); 'paradigmatic' means 'the relationship between a set of linguistic items that form mutually exclusive choices in particular syntactic roles' (Oxford Dictionary online).

Table 4-7 Tri-stratal model of language

Hjelmslev	**Halliday**
plane	**stratum**
Content	Semantics
	Lexicogrammar
Expression	Expression

Halliday first called his semiotic theory 'systemic functional linguistics' but later renamed it 'systemic functional grammar'; adapting and expanding Hjemlslev's Content Plane and Expression Plane, he produced a tri-stratal model of language (see table 4-7). Hjelmslev's Expression Plane surfaces unchanged in Halliday's model but the Content Plane is divided into two strata; the new strata are called 'Semantics' and 'Lexicogrammar'. Lexicogrammar combines words and grammar.

Independent of his three strata, Halliday also identifies three communicative metafunctions of language ('meta-' because the functions are both abstract and generalized); ideational, experimental and interpersonal.

The ideational metafunction is a reflection of experience gained by interpreting phenomena both external (in the world around us) and internal (inside our own

consciousness). It is broken down into two components, experiential and logical; for more information, see table 4-8.

The interpersonal metafunction concerns language as action or the way of acting; it is a representation of the way of doing something during social interaction. It concerns the expression of participants in speech and their roles, desires, feelings, attitudes and judgments; for more information, see table 4-8.

The textual metafunction is concerned with the way language or speakers interact with environment or context; for more information, see table 4-8.

Table 4-8 Halliday 's concept

<table>
<tr><td rowspan="2">ideational metafunction</td><td>experiential component</td><td colspan="3">phenomena: processes, events, actions, states, objects, people, institutions from the real world, etc.</td></tr>
<tr><td colspan="4">logical component: logical relations form patterns of experience</td></tr>
<tr><td rowspan="8">interpersonal metafunction</td><td rowspan="4">our participation in speech situations – social roles</td><td rowspan="2">role in exchange</td><td>giving</td><td rowspan="8">four speech functions:

1.offer

2.command

3.statement

4.question</td></tr>
<tr><td>demand</td></tr>
<tr><td rowspan="2">commodity exchange</td><td rowspan="2">goods and services</td></tr>
<tr><td>information</td></tr>
<tr><td rowspan="4">expression of our attitudes</td><td rowspan="2">role in exchange</td><td>giving</td></tr>
<tr><td>demand</td></tr>
<tr><td rowspan="2">commodity exchange</td><td rowspan="2">goods and services</td></tr>
<tr><td>information</td></tr>
<tr><td rowspan="2">textual metafunction</td><td colspan="4">verbal environment</td></tr>
<tr><td colspan="4">non-verbal or situational environment</td></tr>
</table>

‘A language is interpreted as a system of meanings, accompanied by forms through which the meanings can be realised (Halliday 1978:xiv).’ These meanings are found in chains of forms (structures). System theory ‘is a theory of meaning as a choice, by which a language, or any other semiotic system, is interpreted as networks of interlocking options: ‘either this, or that, or the other’, ‘either more like the one or more like the other’ and so on (Halliday1978:xiv).

Meaning in a language requires the structural organisation of that language; meanings cannot exist without order and structure: form and grammar. Halliday breaks language down, simultaneously, by class (for example parts of speech –

"what is it?") and function (purpose or semiotic value – "what meaning does it express?").

Halliday applies semiotics to language and social order. Social and cultural systems can be represented by semiotic meanings. Semiotic meanings in language construct social systems; conversely, social systems construct semiotic meanings in language. Halliday defined 'social semiotics' as 'the study of relationships between language and social context (situations)'. Language and social structure are inextricably related through semiotic structures in speech situations. 'Text is a form of exchange; the fundamental form of a text is that of a dialogue, of interactions between speakers (Halliday 1985; 11). Halliday established 'three features of the context of social situations':

> The FIELD OF DISCOURSE refers to what is happening, to the nature of the social action that is taking place: what is it that the participants are engaged in, in which the language figures as some essential component?
>
> The TENOR OF DISCOURSE refers to who is taking part, to the nature of the participants, their statuses and roles: what kinds of role relationship obtain among the participants, including permanent and temporary relationships of one kind or another, both the types of speech role that they are taking on in the dialogue and the whole cluster of socially significant relationships in which they are involved?
>
> The MODE OF DISCOURSE refers to what part the language is playing, what it is that the participants are expecting the language to do for them in that situation: the symbolic organisation of the text, the status that it has, and its function in the context, including the channel (is it spoken or written or some combination of the two?) and also the rhetorical mode, what is being achieved by the text in terms of such categories as persuasive, expository, didactic, and the like. (Halliday & Hasan, 1985:12)

Halliday expresses the relationships in table 4-9.

.

Table 4-9 Three features of the context of social situations (Halliday 1978:189)

Component of social context	Functional-semantic component through which typically realised
1.field (social process)	experimental
2.tenor (social relationship)	interpersonal
3.mode (symbolic mode)	textual

Halliday considers language to be part of the social system in meaning creation. Scholars in other social fields incorporated Halliday's concepts into their own fields, for example O'Toole (painting and sculpture), Kress and van Leeuwen

(visual image analysis), van Leeuwen (speech, music and sound) and Martinec (movement).

Holliday's concept of functional grammar is adapted to interpret texts of other arts. It can be used as a starting point for three-dimensional artifacts; for example, Michael O'Toole (1994) was inspired by systemic-functions theory to formulate three distinctive functions to interpret art objects:

1) Representational – representation in art of objects or events
2) Modal – refers to the way art communicates with the audience to create meanings form its elements
3) Compositional – composite the art object and its frame.

He proposed the matrix of analyses of functions and units derived from his methods of analysis of painting and sculpture. His analyses probe art forms and how they communicate through semiotics with audiences.

Michael O'Toole, in his book 'The Language of Displayed Art', proposes three distinctive functions, adapted from Holliday, to analyse meanings in art: Representational Meaning, Modal Meaning and Compositional Meaning. Each function is divided into four units which explain how functions transfer meanings to the audience. A breakdown of O'Toole's functions and their systems is shown in table 4-10 O'Toole assumes that meanings pass in one direction from art work to audience; the audience is passive; he ignores audience interaction. His framework is useful for this research for looking at the composition in the minimal units of art. Digital games differ from paintings in having the third dimension; audiences can penetrate or go round objects; objects can move; paintings do not have sounds; the gameplayer can also move and change viewpoints, thus changing interpretation.

Table 4-10 Functions and systems in painting [slightly amended] (O'Toole 1994:24)

Function→ **Unit↓**	***REPRESENTATIONAL MEANINGS***	***MODAL MEANINGS***	***COMPOSITIONAL MEANINGS***
WORK	Narrative themes Scenes Portrayals Interplay of episodes	Rhythm Gaze Framing Light Perspective Modality	Gestalt: Frame Horizontals Verticals Diagonals Proportion: Geometry Line Vision Colour
EPISODE	Actions Events Agents-patients-goals Facial/side sequence Interplay of action	Relative prominence Scale Centrality Interplay of modalities	Relative position in work Alignment of forms Interplay of forms Coherence of forms
FIGURE	Character Object Act/stance/gesture Clothing components	Gaze Stance Characterisation Contrast: Line Light Colour	Relative position in episode Parallelism/opposition Subframing
MEMBER	Part of body/object Natural form	Stylisation	Cohesion: Parallel Contrast Rhythm Reference

4.3 The Modalities of Visual Communication

Many scholars take Holliday's systemic functional grammar and adapt it to suit other fields of visual communication. Van Leeuwen (2004) argued that theoretical approaches and analytical techniques developed for verbal texts should equally be applied to (and adapted for) nonverbal texts; put another way, theory and analyses for language or literature should be used (and adapted) for visual art. He further suggests that multimodal analysis should be a component of critical discourse analysis (van Leeuwen 2004). Both multimodal analysis and critical discourse

analysis are applied mainly to static texts although later scholars have started to apply them to film and television.

4.3.1 Multimodal Approaches

Modes, in visual communication, are characteristics of visual art. A work of art communicates with its audience though its various modes. A lucid explanation of 'mode' is given by Kress and van Leeuwen (2006:41): 'modes such as facial expression, gesture, posture, and other forms of self-presentation'. Modes are applied in Media Studies; traditionally, each medium has been studied in isolation, 'as just one mode in the ensemble of modes in the production of texts, spoken and written (Kress and van Leeuwen 2006:41)'; thus, a literary text is only the words to the exclusion of all other considerations. Art has always been multimodal but it is only in the digital age that this has come to be recognised as such. 'A spoken text is never just verbal, but also visual, combining with modes such as facial expression, gesture, posture, and other forms of self presentation (Kress and van Leeuwen 2006:41). Kress and van Leeuwen (2006:171) coined the term 'modality marker' to describe the configurations of modes which they likened to a 'voice print' or 'DNA print'. Modality markers are important in this research to record and analyse players' reactions and responses to the modes of World of Warcraft. Digital games combine many media, each having a large number modes – and thus are multimodal; each mode has its own signifying system. Modality markers can be used to analyse and adjust visual modes. Kress and van Leeuwen (2006:160) give examples of modality markers; for colour, for example, they use three scales:

1) *Colour saturation*, a scale running from full colour saturation to the absence of colour; that is, to black and white.
2) *Colour differentiation*, a scale running from a maximally diversified range of colours to monochrome.
3) *Colour modulation*, a scale running from fully modulated colour, with, for example, the use of many shades of red, to plain, unmodulated colour.

For visual analysis, Jewitt and van Leeuwen (2001) suggest using a basic model to interpret visual materials by dividing the analysis into stages. In practice, it could include any number of visual variables or modes such as proximity, content, expression, posture and sound. This research uses some modes from O'Toole's table of modalities categorized by function (meaning) and unit (see table 4-10).

4.3.1.1 Speech, Music and Sound

In visual art, sounds are unique; a painting is integral to its canvas whereas sound happens and disappears. Sound requires a dedicated approach. Van Leeuwen (1999:9) divides the semiotics of sound (including speech and music) into six major domains: sound perspective; time and rhythm; the interaction of voices; melody; quality and timbre; and modality – modality is combinations of modes which can be used compare sounds in art with natural sounds. Sound has intrinsic modality:

modality of sound can be employed to identify configurations and decode meanings. Modality can be employed a resource to evaluate characteristics of sounds in art; modality can be used to identify configurations. Modality of sound is a new concept which enables judgments to be made within its analytical framework and to study how sound interacts between gameplayers and the real world.

4.3.1.2 Movement and Gesture

'Game practices' is a term to describe activities both within and outside the game; it includes interaction and social semiotics. Game practice requires players to interact continuously with the game; this is the primary factor in maintaining the momentum of the game. Interaction in digital games is said to take place in two different 'spaces': physical and virtual. During gameplay, players perform tasks defined by a quest linked to the main storyline. All action and practices, in physical and virtual spaces, are linked cohesively and inextricably. Halliday talks of cohesion of meanings between his three metafunctions.

Martinec develops a small part of Halliday's concept to link it to the modality of actions. 'Cohesion in action' represents 'the way actions or movements relate to one another to form some kind of coherent whole (Martinec 1998, 2000:243)'. Marinec's concept is adapted in this research to investigate cohesion, or possible conjunctions, between action or activities in the game world and action or activities in the real world. Martinec describes three types of 'process', or 'sequence' of actions: presenting, representing and indexical:

- Presenting actions are preformed to achieve a practical purpose such as facial expressions to communicate emotions.
- Representing actions have connotations or semiotic meanings such a policeman using his hands and arms to direct traffic.
- Indexical actions are accompany speech; an example is how, when explaining how to cook a dish, you might accompany your speech with mock chopping, stirring, frying etc.; previous knowledge is required for indexical actions to effectively supplement speech.

Martinec made the point that all actions are part of a network of communications.

It is, thus, possible to trace the development of visual language. Stenglin describes non-verbal sign systems; O'Toole examined painting and sculpture; Kress and van Leeuwen developed visual image analysis; Van Leeuwen studied speech, music and sound; one component of Halliday's theory of functional grammar was adapted to movement by Martinec. See table 4-11 for comparisons the work of these scholars.

Table 4-11 Comparison of non-verbal semiotic systems of communication (Stenglin 2004: 51-52)

Portable tools from SFL	Visual images: O'Toole	Visual images: Kress and van Leeuwen	Music: van Leeuwen	Movement: Matinec
1.Social orientation to meaning-making	✓	✓	✓	✓
2.Metafunctions	✓ Representational Modal Compositional	✓ Ideational Interpersonal Textual	✓ Ideational Interpersonal Textual	✓ Ideational Interpersonal Textual
3.Axis (paradigmatic and/or syntagmatic)	✓ Paradigmatic (typology)	✓ Paradigmatic (typology & topology); some syntagmatic structures	✓ Paradigmatic (typology & topology)	✓ Paradigmatic (typology & topology)

Non-verbal semiotics uses the same tools as systemic functional grammar, such as social orientation to meaning-making and metafunctions. The exception is O'Toole; he replaced Holiday's nomenclature with his own, especially for painting and sculpture; later scholars reverted to Holiday's. O'Toole's Experiential metafunction concerns experience; Interpersonal, relationships; and Textual, constructions. Stenglin adopts architectural semiotics, for example, he divides constructions into levels: Building, Level, Room and Element. For interpretation of non-verbal texts, Stenglin concluded that all four concepts deployed the theory and analytical techniques of language. Stenglin further mentions that O'Toole employs the paradigmatic function (typology) in his book 'Language of Display Art (1994)'; he applies the sub-theory of Axis in Language to interpret architecture. His classifies architectural features through architectural criteria; for example, he divides the Practical function into the following subsets:

Public/Private
Industrial/Commercial/Agricultural/
Government/Educational/Medical/
Cultural/Religious/Residential;
Domestic/Utility

We have reviewed a variety of theoretical approaches from traditional semiotic to multimodal. Appropriate theories must be selected, adapted and integrated. Theories must translate into practices that will yield required data; the data will be analysed; the resultant analyses will enable the construction of a visual grammar for World of Warcraft in a format which will allow its application in other applications.

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CHAPTER 5. VISUAL GRAMMAR IN THREE-DIMENSIONAL ONLINE GAME

Buckingham (see chapters 2 and 4) envisaged four concepts in the formulation of a visual grammar for online digital games: (a) Representation (b) Production (c) Audience and (d) Language. Buckingham's four concepts match the two primary concerns of this research: the visual landscape of digital online games and interaction. Buckingham's concept of four components is adopted in this chapter by defining the visual landscape and interaction as follows:

(a) Representation refers to visual displays which combine graphics, sounds and verbal text. This component is adopted to define WoW's features for analysis in this chapter.
(b) Production incorporates designers, technology and software, and relationships with other media. This component is excluded in this study.
(c) Audience encompasses player experience and pleasure, social and interpersonal play and fan culture through other media. This is adapted to analyse player experience and frame visual grammar in term of 'Experience' which will be discussed in the chapter 6.
(d) Language may be defined through the functions of texts, game properties and characteristic gameplay, role of player, and components of game properties. This component and its features are adapted to define the site of game and the site of player and interaction which will be discussed in the chapter 6.

We shall also investigate how visual elements construct meaning and how meaning is transferred to and interpreted by players. According to Gestalt theory and visual semiotics, works of art are constructed from small elements based on the principles and rules of composition. In digital online games, as in works of art, small elements underlie visual complexity. To understand an online game, we need to investigate how visual components are assembled and create meaning; also, what principles govern their organisation? This chapter examines the framework of visual grammar in World of Warcraft. Trustworthy analytical tools are required.

5.1 Constructing Analytical Frameworks from Theory

Eco places sign components in either the Expression Plane or the Content Plane. The two planes are generated and controlled by codes (the rules of sign functions). Eco's Content plane and Expression Plane are adopted and adapted in this research. The Content Plane deals with visual forms, design themes, the game story, etc. while the Expression Plane deals with principles and rules of visual organization and syntactic rules – the principles and rules organize the content in the game

landscape. Saint-Martin's coloremes (see chapter 4) are also incorporated to analyse the basic visual elements of the game. Syntactic rules are applied on the Expression Plane. Arnheim's visual perception framework and Gestalt theory are applied in both planes. (see figure 5-1)

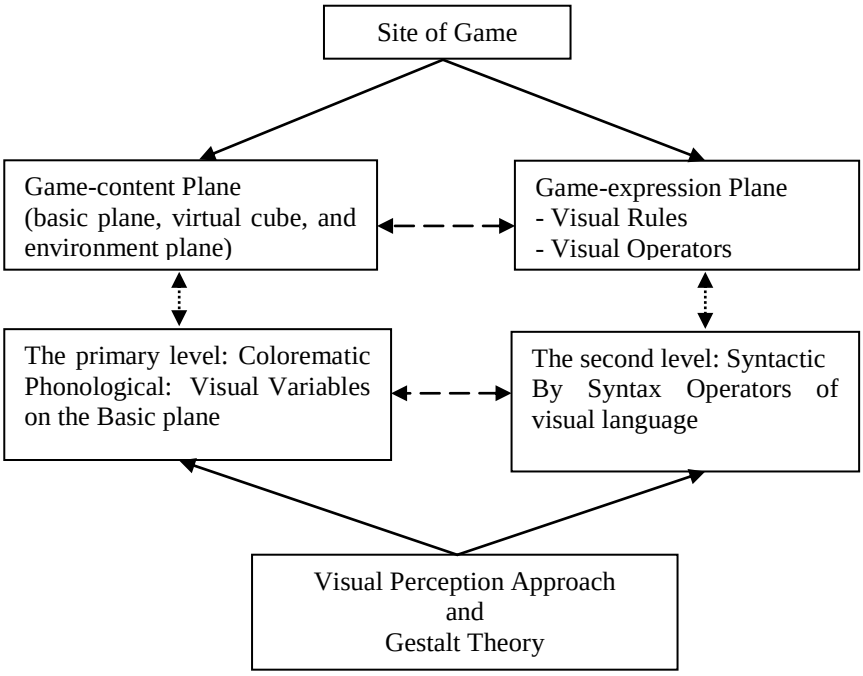

Figure 5-1 The analysis framework of visual semiotics

Visually, some parts of World of Warcraft imitate the real world. Saint-Martin's concepts of Basic Plane, Virtual Cube and Environment Plane (see chapter 4, Par 1), are incorporated into the Content Plane. The Basic Plane is common to all art forms. Game designers use Saint-Martin's planes to create setting and props, a process called 'mapping'; it can, for example, include projecting a wood texture to create the wall of a house. The Basic Plane can be employed as part of the analytic framework, similar to its original purpose in painting and sculpture.

5.2 Applying Basic Analytical Tools to World of Warcraft

This section describes the initial visual analysis to collect data to establish a dedicated visual grammar of World of Warcraft: the author analysing screenshots of his own World of Warcraft play.

5.2.1 The Basic Plane in the First Analysis of World of Warcraft

Early screenshots captured from the author's play were set in the World of Warcraft's virtual landscapes; the landscapes contain many fantasy objects such as bridges, rivers, trees, grass, flags, avatars, magic lights, fantastic sky colours, etc. The 'virtual landscape' may also be called the 'virtual geography' or 'virtual environment'; it represents the game territory; it imitates real landscapes in some respects: plains, forests, mountains, sky, space, under the sea, desert, buildings and inside buildings, etc. The game landscape is ornamented with and populated by other game objects including sounds; 'game landscape' is also called 'gamescape'. Each fundamental storyline in World of Warcraft has a dedicated gamescape but, additionally, subplots have their own designs. Features for analysis in the gamescape include object organisation, colour themes, sound design, patterns of movement, etc.; each game or subplot has an overall design theme. ***Players have the option of first-person perspective, through the eyes of their avatar, or third-person, through the "camera" lens. In the third-person perspective, players have two further options; they can move the virtual camera, or they can fix the camera position and move the avatars. Players can switch perspectives during a game and zoom in and out.***

5.2.1.1 The Position Index: An Index to Define a Position on the Gamescape

To analyse World of Warcraft, is necessary to be able to locate or position avatars, characters and objects within the gamescape. Each gamescape represents a large, complex geographical area – an underwater city, an underground city or a floating city and so on; from this point, '**location**' will refer to a place such as might be found on a map: a forest, a road, a building, a camp, the sea, etc.; this is not of a major concern of the research. '**Position**' will be used to describe where anything – objects, avatars, characters, sea, sky, roads – is 'positioned in an image' and means 'here' an image on a screen.

To describe the position of something in an image is not easy and World of Warcraft presents additional difficulties. Players have the option of first-person perspective, through the eyes of their avatar, or third person, through the "camera" lens. In the third-person perspective, players have two further options; they can move the virtual camera, or they can fix the camera position and move the avatars. Players can switch perspectives during a game and zoom in and out. Enormous complexity is created by these perspectives; such complexity is beyond the analytical capabilities of this research in the time available. For this reason, for the purposes of this research, players are restricted to the third-person perspective, they may fix or move the "camera", or do both during the game, and zoom; they may not use first-person perspective.

To fix a position in an image

There is no single method to fix positions in an image or screenshot; rather, three distinctive methods which will be applied in this research. Three-dimensional positioning will not be employed; screenshots (i.e. on the Basic Plane) captured during gameplay will be analysed.

Convergent lines – Convergence lines, for example where land, sky and sea meet, can be useful, but not always since forests and buildings may obstruct views; even in real life, it can be hard to know where the edge of a city, the edge of a forest, or the edge of the sea is located. Convergent lines will be discussed again in the later in this chapter when it will be used to analyse visual elements and game objects.

Layers of vision – When looking at a landscape the eyes are naturally drawn to points of interest which are usually in the middle distance in a horizontal band; this is known as the 'middle layer'. The foreground of the scene forms a lower band in the composition and is known as the 'frontal layer'. The upper horizontal band is known as the 'background layer'. Although points of interest are usually in the middle layer, it is possible for them to be in frontal or background layers. Points of interest depend on the camera; the camera controls perspectives.

Grids – Grids have their origins in the Rule of Thirds in photography. The Basic Plane is divided into a grid by lines one third of the distance from each edge. The Rule of Thirds states that the most interesting parts of the composition lie at the intersections of the lines on the grid; photographers will often try to align compositional elements such as the horizon or a tree along these grid lines to create a strong composition. This is not a hard-and-fast rule; breaking the rule can also produce a strong composition. This grid is adapted in this research to analyse screenshots by enabling a quick and easy way to describe positions of visual elements in the composition. The blocks created by the Rule of Thirds are numbered, as shown, to be able to conveniently describe positions within the frame. The concept of grids can be extended to three dimensions but, due to its complexity and technological limitations, is beyond the scope of this research; it should enable future research projects. A variation of the three-dimensional grid can be applied to spheres similar to latitude and longitude on the globe.

1	**2**	**3**
4	5	6
7	8	9

Analysis of the author's own gameplay

Plate 5-1 The quest journey at the Sunsprise Hall of Silvermoon City

The author of this paper started by analyzing his own gameplay. The objective was to implement and test the three methods determining position onscreen and perform the first visual analyses of World of Warcraft. The gameplay is recorded on video (see the first gameplay videoclip). The chosen game was a quest – 'Defending Fairbreeze Village'; the journey starts at Sunspire Hall in Silvermoon City. The videoclip is 2 min. 25 sec. long. It was randomly broken down into a storyboard of 30 screenshots (see plate 5-1). For gameplay, the author's avatar was of the Blood Elf race and warrior class. The story was that he, in the form of the avatar, had to find non-player character (NPC) in the Sunspire Hall. With regard to plate 5-1, the author palyed in the first-person perspective from 00:00:05 to 00:00:19 and from 00:01:06 to 00:02:20; and in third-person perspective from 00:00:23 to 00:00:01. Initially one screenshot, at 00:01:38, from the storyboard was chosen for analysis of visual composition. The screenshot is shown enlarged in figure 5-2. The author's avatar, in third-person perspective, is in the centre of the screen, in the foreground level giving the illusion of being close to the player. The screenshots show various menus available to the player; this is the interface between player and game. Game menus are used in creating visual grammar; the game menus, to be described later, are:

- Experience Bar
- Minimap
- Character Status Bar
- Quests Bar
- Chat Logs

Figure 5-2 The analysis of the reference position system

Interfaces can be adjusted during play by the player as demonstrated from 00:01:43 to 00:02:11 in the videoclip. The player can show or hide menus or relocate then on the screen. Visual representation can be altered, for example by exercising the camera options. If we accept that the avatar is the centre of interest, it can be a point of reference to position other game objects. To the left of the avatar, there is an NPC (non-player character). Also on the left are two trees floating in the air, chairs, a round table, pillows on the floor, a wall lamp and two more NPCs. These objects are called 'props', a term to describe objects which decorate the game environment. To the right of the avatar are several NPCs and strange creatures standing close to the wall. The NPCs and creatures have names and skill levels displayed above their heads. Some objects are in motion and some stationary. Objects in Figure 5-2 can be grouped by space and position. We can imagine a line along the base of the wall dividing the screenshot into tow horizontal bands. One band encompasses everything in front of the wall; the other band is the wall and its decoration. We can, alternatively, use the avatar to divide the screenshot vertically;

this may create problems in describing position, since the avatar is moving and will not always be in the centre of the screen.

Figure 5-2 illustrates an interior; spaces are delimited. Exteriors are more complex and it is more difficult to position game objects. Figure 5-3 shows a landscape extracted from the storyboard, at 00:00:51 in plate 5-1; the perspective is first-person and it is a high-angle shot.

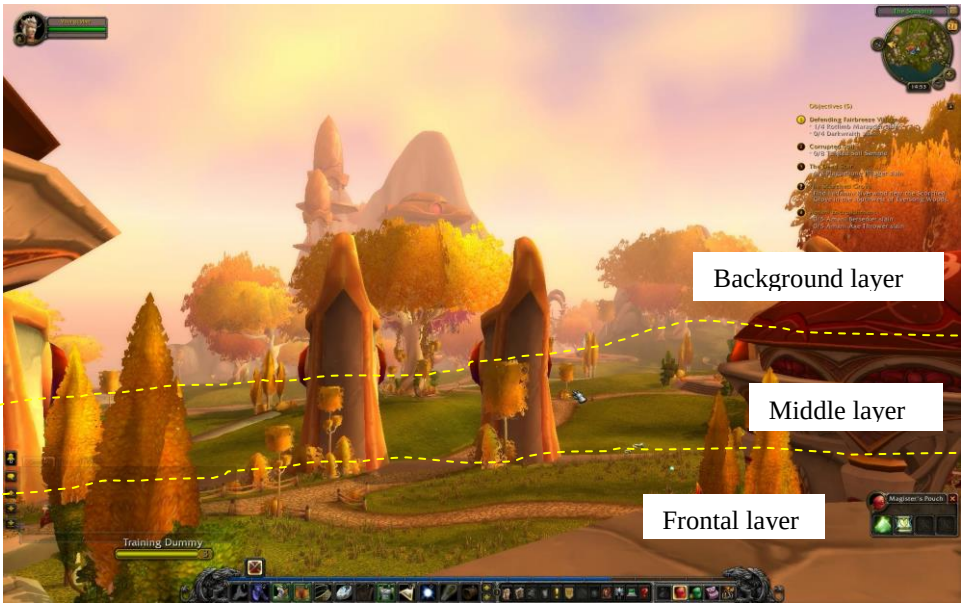

Figure 5-3 The analysis of the outdoor landscape

We cannot sue the avatar as a reference point to describe position. Starting with the two pillars in the middle as points of interest, the screenshot can be divided into three horizontal bands as shown. In photography and film (Zakia 2011:10; Clark 2011:87; Ward 2003), the 'bands' are called 'layers' and this term will be adhered to in this research.

An exterior composition can normally be divided into Frontal Layer, Middle Layer and Background Layer. In Figure 5-3, the Frontal Layer contains the terrace of a building, grass and a road; the Middle Layer contains a building, a big mountain and two pillars; and the Background Layer the sky. The layers depend on the position of the "camera", camera angle and whether the avatar is first or third person. The dynamics of the game create movement and bring it to life. 'Visual dynamics' is physical movements such as the wind blowing leaves; the movement

of monsters and background noises including birds singing; 'dynamic of change' refers to the continuous change on screen including encompassing the movements of avatar, objects and camera. Players interpret the visual dynamics and the dynamic of change during play. The position referencing system locates game objects, and how they change and move in the game environment; it also helps us identify points of interest and how the player observes game objects during the quest. The 'camera' will be discussed further later in this chapter. The three layers are useful to reference positions in the game environment but they do not provide a precise position in three-dimensional space; however, positioning the layers is subjective.

The lines which delineate the three layers can be irregular, to fit any landscape. Landscapes can be found at any kind of location in the gamescape including underwater, in the sky or underground; screenshots do not have to have all three layers – only one or two may be evident. Plate 5-2 illustrates a screenshot with only two layers; it comes from a videoclip 'Flying with a master's licence' occurring at Hellfire Peninsular in the 'Void Ridge quest (duration: 3min 49sec).

Gameplay was recorded when players reached a skill level of 62; this shoes that they have flying experience and have bought a Master Flight licence from an NPC. Gamplay started with the player buying the flight licence from the flight trainer; the player then flies to the to the target area of the quest. Players always flew from high ground since they had not obtained a proper licence. The video clip displays the game environment during the flight to the target area. The video clip is broken down into a storyboard in plate 5-2 to enable the positioning of game objects landscape and sky. The storyboard comprises twenty-four screenshots randomly captured by the software.

Plate 5-2 The first fly with mater license on Hellfire Peninsula

Figure 5-4 The first fly with mater license on Hellfire Peninsula

The screenshot in figure 5-4, at 00:03:33 has been selected for discussion. The extent of the sky makes analysis by the three layers impractical; the sky lacks reference points to establish position.

The Rule of Thirds suggests that placing objects of interest at the intersections of the gridlines results in a strong composition in photography and films (Zakia 2011:10; Clark 2011:87; Ward 2003). In this study the Rule of Thirds is applied to number nine parts of the image to establish reference positions and, as shown, has been applied to the screenshot in figure 5-5. The nine parts of the image provide a more satisfactory reference system for position than the traditional method of positioning to the left or right of the avatar. Applying the Rule of Thirds establishes object positions in the sky.

Figure 5-5 Applying the Rule of thirds to the sky landscape

The grid from the Rule of Thirds is unsuitable for landscapes such as figure 5-3; it is more satisfactory to work from the points of interest and reference objects by the three-layer system. Every landscape is different and the three-layer system adapts to referencing position in relation points of interest within any landscape.

It may be argued that applying the three methods of referencing position to screenshots is unsatisfactory because screenshots are stills extracted from a moving image. Can the theoretical approaches of painting and photography be applied to games? This has been discussed in chapter 4. One point is that, although some objects may move, others are stationary in the game landscape. Of greater importance is that the gamplayer, like the film or television viewer, is watching a

series if still images; which give the illusion of movement. Still images are the starting point for game designers; conversely, breaking moving images down into still images is the starting point for analysis. When events need to be analysed, people will normally resort to examining still images extracted from video images; this is known as video ethnography. Differences between still and moving images can be summarized as follows:

Still images	can be anaylsed for the composition of objects and relationships between objects
Moving images	can be analysed through the interconnections an relationships between objects and locations; interaction and movement with time and place can be observed

It is necessary to discuss how to reference positions of objects, avatars or NPCs in moving images. The layer system does not provide a precise enough positional referencing system for moving images. To investigate object movement, the researcher needs to understand how objects move and where they move to; the grid system does not provide sufficiently specific points of reference.

A map with grid references is provided in World of Warcraft; X and Y coordinates inform players of their position in the game landscape; the coordinates are approximate and cannot position an object accurately. The World of Warcraft maps are not equivalent to the global positioning system; coordinates cannot be applied to moving objects. The way forward is to examine the how the game was originally constructed and to use similar methods to take the game apart to establish position, bearing in mind that three dimensions are analysed on a flat screen.

World of Warcraft designers use three-dimensional software, positioning objects by Cartesian coordinates (Avgerakis 2004): Xx, Yy, Zz. Cartesian coordinates were devised by René Decartes to position specific locations having the same distance from the target on two axes (i.e. on a circle). Extending Descartes' idea to a third axis, enables three-dimensional positioning on a sphere, as illustrated in figure 5-6. Most game objects are created in 3D using Cartesian coordinates, Xx, Yy, Zz, upper-case letters referring to the three axes and lower case to the scales on those axes. (see figure 5-6)

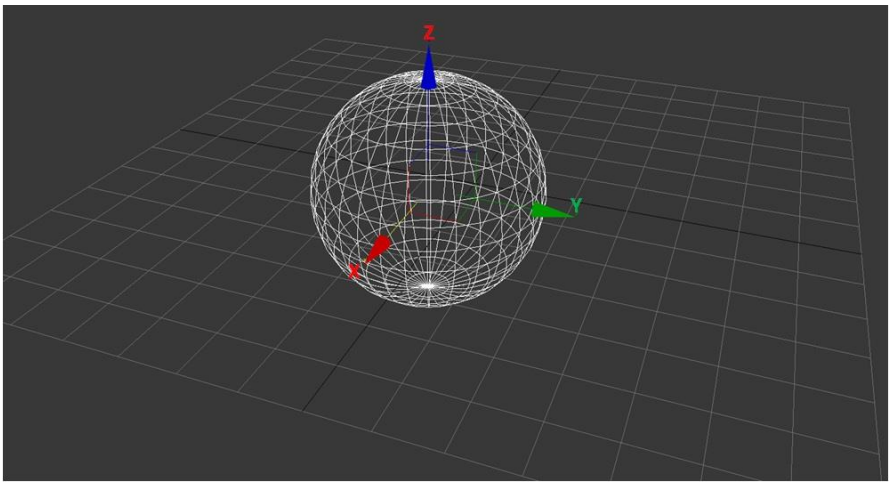

Figure 5-6 The 3D axis and Grid plane in 3D software

In figure 5-7, the illusion of three dimensions in the landscape is achieved by the yellow and blue axes intersecting other axes at the following coordinates:

XaYaZf (A)

XaYaZg (B)

XaYbZg (C)

ZaYbZf (D)

XbYaZf (E)

XbYaZg (F)

XbYgZg (G)

XbYbZf (H)

These eight intersections create sub-matrix of three-dimensional space in the gamescape and can be used to position objects. Three-dimensional space in World of Warcraft is created by three-dimensional software using the three-axis system. It would en sensible, therefore, to apply the three-axis system to accurately reference positions in the virtual world; this system is unsuitable for gamescapes which lack dominant objects, e.g. in space or underwater – illusion of depth can be created by

reference objects; without such reference objects, a grid for mapping position is hard to create.

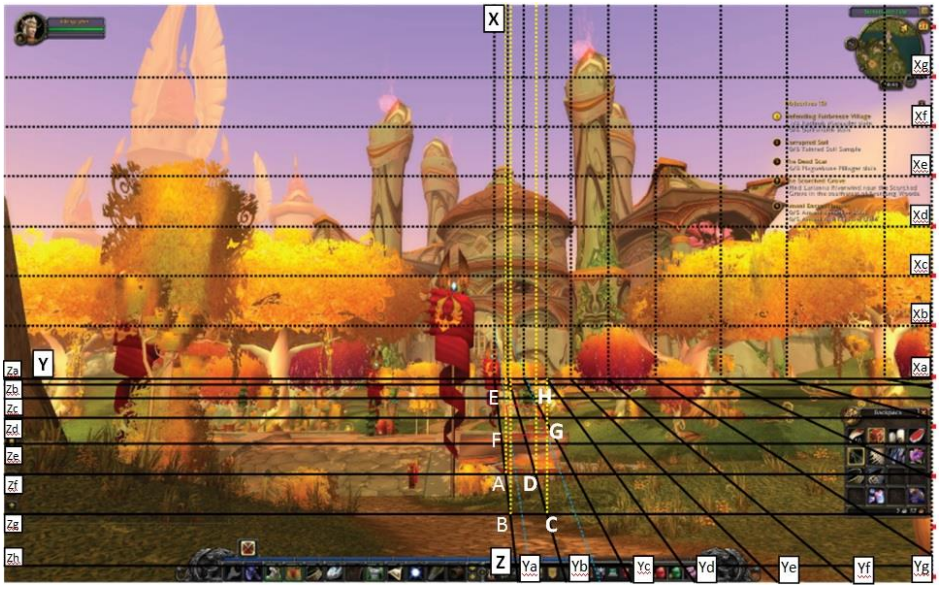

Figure 5-7 The 3D grid system on the gamescape

The 3D grid system does refer to virtual, not physical, space. The three-dimensional grid system is dynamic: when a player changes "camera" position or viewpoint, a new 3D grid system is required in a new location. The 3D system is of limited value because it requires the player and "camera" to be still; no movement through the landscape could be allowed. If either player of camera moves, reference points will also change. The 3D system is useful for tracking the position of an object at the opening of play, during play and at the end of the game; the movement of the object during the quest can be charted; if we need to trace the movement of an object throughout the game, we require a mechanical way to do it; one person could not do it manually. This technique will not be employed in this research but software advances may make its use practical in the future.

In this research, the primary method of positioning objects will be the layer system but three-dimensional grids will also be employed where they are more effective. Objects and movement in the game landscape can be monitored to help develop the visual analytical framework in accordance with Saint-Martin's visual semiotics.

5.2.2 Classifying Video Game Components

This research will borrow will apply several of Saint-Martins' visual language concepts, especially her colormatic and syntactic ideas. 'colormatic' refers to the relation of visual variables in the Basic Plane; 'syntactic' refers to operation and organisation of coloremes.

5.2.2.1 Determining the Basic Elements of Visual Grammar in the Game

To begin at the beginning: 'phoneme' is the most fundamental unit of a written text. Applied to visual art, Kandinsky describes phonemes as the basic elements pictorial discourse – point, line and colour. Jacques Bertin (1973) expands Kandinsky's definition to encompass seven distinctions of visual variables:

- position (*x*- and *y*-axes)
- size
- shape (form)
- value (tonality)
- colour (hue)
- orientation (alignment)
- texture

Saint-Martin further classifies Bertin's distinctions into two groups:

plastic variables	texture
	colour
perceptual variables	dimension
	boundaries
	vectoriality
	Implantation (position)

Bertin's original concept was to take graphical visualization in the cartography and convert qualitative data (e.g. colour and hue) to quantitative (e.g. area). He coined the term 'marks' to describe visible graphical forms presented through visual variables; he notes that:

A black mark of minimum visibility and **discriminability** must have a diameter of 2/10mm. But this is not absolute, since a constellation of smaller marks is perfectly visible, … A mark can thus express a correspondence between the two series constituted by the TWO PLANAR DIMENSIONS fixed at a given point on the plane, the mark, provided it has a certain dimension, can be drawn in different modes. It can vary in SIZE, VALUE, TEXTURE, COLOUR, ORIENTATION, SHAPE and can also express a correspondence between its planar position and its position in a series constituting each variable. The designer thus has eight variables to work with. They are the components of the graphic system and will be called "visual variables." They form the world of images. With them the designer

suggests perspective, the painter reality, and the graphic draftsman ordered relationships, and the cartographer space (Bertin 1983:42)

Bertin assigns visual variables attributes which can be manipulated to represent other information. Bertin's concept does not include movement, for example film, animated drawings or wavering of an image; consequently, it excludes visual elements which express distance and illumination and have relief (i.e. thickness) and anaglyphs (images in low relief in contrasting colours). These limitations cause problems in this research which is predicated on the relief of moving images.

The basic visual elements in a game are different from those which Kandinsky uses to define art objects; these objects are perceptual elements which contain considerable information. The basic visual elements of games are limited by technology, both hardware and software, but generally, by combining basic elements including sound, they have more complex forms. Due to limitations of technology visual representation in games has boundaries which do not ally to traditional artworks. Games cannot be presented in a full range of colours or in high detail because of technological limitations; another factor is that higher quality would require even longer download times – game objects have to have to be designed in low quality to visual display. Another important point about digital games is that whereas painters work with a brush, game designers use digital tools. Bertin's visual variables contribute towards analysis of games but the seven distinctions are too rigid to be applied fully. Digital Game landscapes are based on the the concepts of visual design developed from art theory and gestalt theory. Saint-Martin's visual variables are useful for their clarity and for categorisation.

Analysis of the basic elements of visual variables in figure 5-2 must take into account the elements employed by the designer: line, colour, shape, form, light and texture. Lines are to create the shape of the mat on the ground and the form of the wall and other objects. In this screenshot, red is dominant; red is the colour of most objects and the window panes are red; the flag is red and the cushions mostly red; the landscape is red – red is a theme of this game's design to make it distinctive and different from other games and other territories in this game. Shape and form are marked by distinctive textures to mimic variety and complexity of the real world as in the floating trees, avatars' costumes and the flag; texture is created from other elements such as dot, line, shape, form and colour (see figure 5-8). Light shines in through the windows and there are candles and magic lights; light is important in giving the game its own style. In the exterior screenshots of plate 5-1 (figures 5-3 and 5-7), the shape and form of the buildings, notably the two towers and the giant city pillars, are assembled from curved lines; the curves represent a sense of dynamics, a flow of energy (magic power), unique to this city. Curves are used for interiors as well as exteriors; ovals are common but are balanced by triangles on the tops of the city pillars. The shape of the manicured trees is partly oval; even though they are floating, they are green and instantly recognizable as trees, providing a

natural contrast to the unnatural characters, landscape and buildings. Visual elements are not the only factors in game design; designers must also take into account other principles of visual design such as balance, dynamics, contrast and dimension.

Figure 5-8 The analysis of the reference position system

Saint-Martin calls the basic units of visual language 'visual variables'; she borrowed the term from cartography; 'visual variables' is quantitative term unsuited to this research because it focuses on visual aesthetics and design. Artists and visual designers generally use the term '**visual elements**' and this term will be employed in this research. Some aspects of design – dimension, balance, dynamics, movement, etc. – are separately termed '**principles of visual elements**'; they organize and structure the visual elements.

Primary Visual Elements are the original abstract units of visual language: point, Line and Colour. These elements resemble the plastic phonology of F. Thürleman and the plastic variables of Saint-Martin but adjusted to useful in the study of games.

Secondary Visual Elements are perceptual and subjective; they are complex and may be partly built from primary visual elements: Shape, Light Form, Space, Texture and Sound.

Games are designed by combining and composing visual elements. To create an avatar, NPC, object or landscape, designers combine and organize visual elements using two-dimensional and three-dimensional graphical software. Some game objects are provided for players to edit to make their own objects; these new objects are still, fundamentally, ready-made; they are kept secret until needed. The software used to design games serves the same functions as the artist's brushes, canvases, paint, etc. Two-dimensional graphical software is used to create two-dimensional images, including, for example, textures, which can later be 'mapped' onto three-dimensional objects which will have already been created in three-dimensional graphical software. Three-dimensional objects are created in three-dimensional software from both primary visual elements and two-dimensional objects. The way that game objects and landscapes are created is similar to the way that art is created from basic art forms. Some art theories, such as gestalt theory, can be incorporated into analytical frameworks for games; likewise, the Basic Plane can be applied to the analytical frameworks for both two- and three-dimensional objects – its application is not limited to two dimensions.

Visual elements require visual principles to create complex forms. Complex forms have their own properties derived from the properties of the basic elements; however, meanings of complex forms are not directly derived from the meanings of their basic elements. Meanings of complex forms depend on factors such as context, interpretation, experience, background knowledge, etc. Each territory in a game landscape is constructed from millions of objects, all assembled from combinations of visual elements. Game designers put objects together to tell a story visually. Visual principles are necessary to compose the visual landscape; coloremes are unsuitable for analysis of games because the concept was devised for paintings; games have movement and sound and are in a 3D environment. 'Visual composition' lays down the basic principles to describe how objects combine; games are not like paintings but are constructed from two-dimensional compound forms and three-dimensional forms.

5.2.2.2 Visual Elements and Their Properties

In figures 5-3, 5-7 and 5-8, objects are created by combining visual elements. The mat in figure 5-8, for example, is created from line, shape and colour. Visual properties have attributes – for example, the element 'colour' has properties of hue, shade, tint and value; visual properties have attributes, for example darkness and lightness. Attributes are, therefore, a sub-category of property. Game objects generally consist of compounds of visual elements such as line, shape, form, colour, space, texture and sound. The game landscape, or gamescape, is a playground in the virtual world where players interact and play the game. It is the designers' intention that much of what players see should be interpreted for as an integral part of the play (Nardi 2010). To interpret objects in a gamescape (Mortensen 2006), we need to deconstruct their visual elements.

5.2.2.2.1 Primary Visual Elements

The primary visual elements are point, line and colour (figure 5-8). The most basic visual element is the point. Figure 5-9 illustrates a sphere; the sphere used to create three-dimensional objects and game landscapes. If we expand a point, it becomes a sphere. Points and lines on a sphere (figure 5-9) are used by game designers to create a three-dimensional environment.

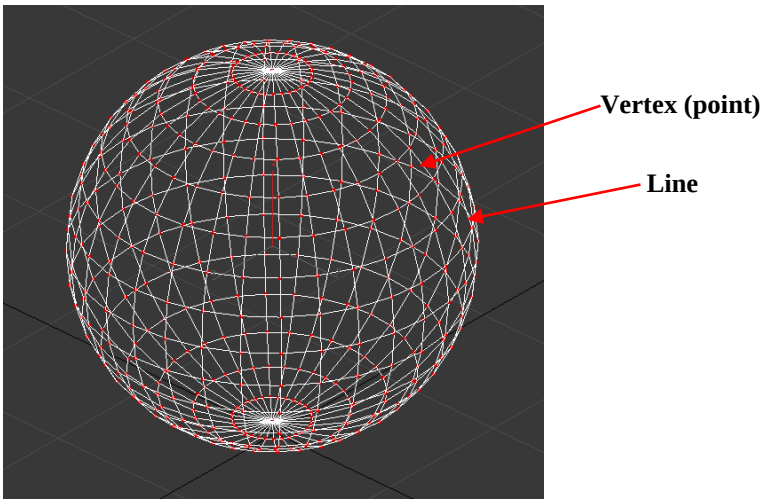

Figure 5-9 The primary visual elements: points and lines

(a)**Points** – The X, Y and Z axes intersect at the centre of the sphere; they can be used to describe the position of any point. Lower case letters, x, y, z are used to measure distance along; this any point can be precisely located as Xx, Yy, Zz. In practice, the three axes are used to form a grid on the surface of the sphere, similar to lines of latitude and longitude. Points have no dimension in Euclidian geometry but, in graphical software, they can have properties and attributes, perhaps making them more like dots. A 'vertex' is the meeting point of lines which form an angle. In graphical software, a vertex is the intersection of lines of the grid on the sphere. Attributes can be added to the characteristics of points.

Figure 5-10 The analysis of the lines

(b)**Lines** – Lines, like points are also primary visual elements; they also possess properties and attributes in graphical software. In figure 5-10 (from 'Defending Fairbreeze Village), we can see examples of vertical, horizontal and curved lines. Lines are used to draw shape, form and texture. They portray different game objects and are used to construct gamescapes. They illustrate trees, avatars, flags, bridges, rivers, buildings, etc. Objects, whether two- or three-dimensional have edges. Contours differentiate trees from other shapes; buildings, grass, bridges, and flags all have their own shapes and textures.

Line Properties lines can be horizontal, vertical, jagged, diagonal and curved; they can be thick or thin. Some scholars categorise lines descriptively according to whether they are geometric or organic. Geometrical lines are mathematical in origin. Geometrical lines are biomorphic in origin, i.e. from nature. Lines are one of the most basic elements for designers; designers use points and lines to edit objects. Lines can be adjusted through their attributes: size, colour, length and shape.

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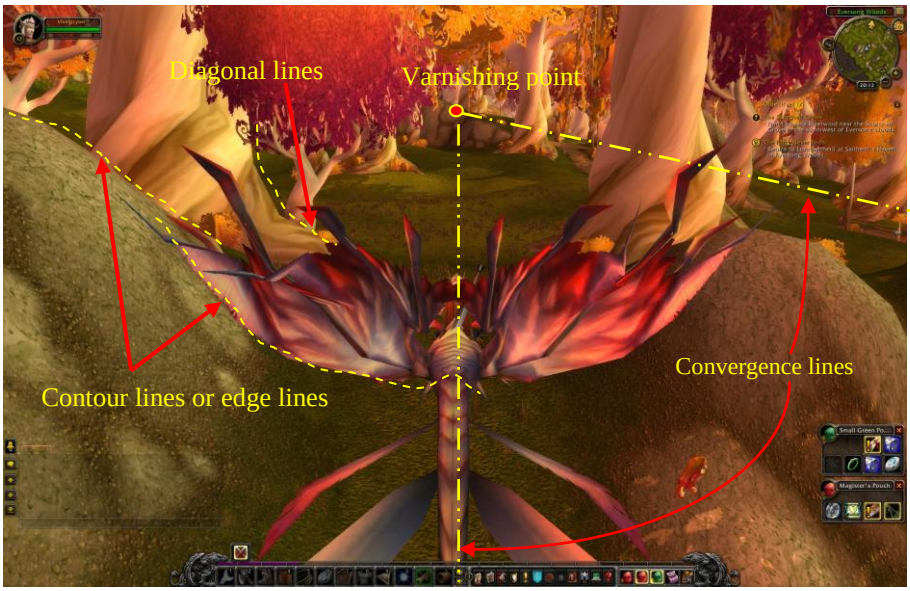

Figure 5-11 the lines on the gamescape in the Eversong Woods

Lines can be used to create the depth dimension in a visual composition. Objects can be arranged on the Content Plane through the principles of visual composition (to be discussed later under the topic 'Visual Rules'; this composition includes the construction of an eye-line. An eye-line is an imaginary line to guide players. In figure 5-11, the eye-line leads to a vanishing point in the forest, helped by convergent lines. Figure 5-11, a screenshot from a gameplay video, 'The Part Never Ends', demonstrates how lines can be expressive; they illustrate the distinctive shapes of objects such as the Blood Elf (the avatar who rides the Dragonhawk); Springpaw (a big cat); stones; trees; and grass whose shapes are distinguished by their contour lines. Most game objects are drawn with compound lines which combine attributes to construct visual elements. Such lines can render a forest aesthetically pleasing, distinguishing types of tree and differentiating one forest from another. Lines work with, and are not independent of, other visual elements. Convergent lines are imaginary and help players to separate areas such as ground and sky.

(c) **Colours** – the third visual element is colour. We have already discussed use of colour in the figure 5-8: mostly warm colours – red, orange and brown in this interior; a cool colour, light blue, seen in the exterior, provides contrast. In plate 5-2, red is also dominant in the gamescape and atmosphere, both of which are contaminated and toxic from historical events which are noted in the game story.

The gameplay videoclip 'Colour Usage in World of Warcraft' investigates use of colour in the game. Figure 5-12 is a screenshot from the videoclip.

Figure 5-12 Color signified in Silvermoon City

Colour is a semiotic domain; meanings depend on culture and context. For game designers, colour relates to the theme of a game and its contexts. Sanders and Novak provide a general rule of colour: '… the number of colors to use in an interface is the minimum number required to achieve the design goal. Using more colors lessens the visual impact of each and thus reduces the overall effect of colors.' The screenshot from World of Warcraft (figure 5-12) has mostly warm colours – red and yellow – which are primary colours. They dominate the landscape and establish the visual design theme. The other colours are violet and green; they are tertiary and limited in application. Arnheim (1974:353-356) calls this kind of colour combination 'syntax of combinations': mixing different kinds of colour creates more colours. Colours of objects imitate the colours of the real world. When a designer colours objects, the colours are not solely visual representation but convey aesthetic meanings such as strength, magic, pleasure and excitement. Because of limitations of textures, colours in World of Warcraft combine with other elements to create the visual environment; for example the trees in figures 5-2**,** 5-3, 5-7 and 5-11 have only a single shade and no leaf texture. Colour is also a factor in expressing themes in each territory within a game. Colour can impart feelings such as pleasure and emotion.

Interfaces, illustrated in figure 5-12, are Character Portrait, Minimap, Tooltip, Interface Bar, Action Bar, Chat Log and Quest Bar. The Quest Bar and Quest Details are distinguished by different colours which highlight titles and quest instructions; text is yellow or white and the background grey or superimposed on the game images. Colour gives prominence to titles displays hierarchies. Texts are not framed; they float on the screen. Text colours are simple and the text is standard, i.e. not bold. To convey textual information, certain typographical rules are applied: (1) use few font types or colours (2) font size should be at least 14 point (3) it must be readable (4) it must be consistent within a particular game; additionally the quest is in order of execution and in straightforward language.

Text interfaces are designed so that different functions and their types of meanings are easily distinguished and located; this is a form of visual language – a dialogue between designer and player. Players can move text to suit themselves. Interfaces and their manipulation are designed to be unobtrusive and distract players from the flow of the game as little as possible. The navigator is small map which can be expanded; it gives location, direction, time and other information visually. During play, the map is used to navigate the gamescape using arrows to indicate direction in accordance with instructions for the task. Interfaces are active or passive; players can interact with the game and with other players.

The Experience Bar lies along the screen bottom; it can be expanded to its full size or reduced to one row. The Experience Bar contains the Action Bar, Interface Bar, Latency Bar, Bag Slots and Backpack Bars (see the figure 5-12). All bars contain icons of the objects which are available during gameplay. The bars also record players' experience, scores and skill levels. Small icons imitate the shape of objects that they represent; they are signs. Icons of the objects signify functions of the objects in the real world which may not be the same as meanings within the game thus allowing for dual or multiple meanings; additional meanings are understood by designers and players and develop through the experiences of players and designers. Players extract and assign meanings during play.

Colour alone does create meanings, but works in combination with other visual elements. Colours in the game are produced via the RGB (Red Green Blue) colour system and displayed in combination to produce the full spectrum of colour on an electronic screen; the number and quality of colours, therefore, depends on both the designer's and player's hardware and software. Many theories seek to explain colour in terms of visual language. Kress and van Leeuwen (2006) suggest that the role of colour in three-dimensional visual communication is the same as in two-dimensions. The properties of colour are:

- Hue: purity
- Shade: darkenss by mixing with black

- Tint: lightness by mixing with white
- Value: brightness

Colours are classified into three types:

- Primary Colours: RGB – Red-Green-Blue
- Secondary Colours: a combination two of primary colours; for example, mixing green and red produces yellow.
- Tertiary Colours: a combination of primary and secondary colours.

Computer graphical software provides further options to adjust colour attributes:

- Size: the area of a colour on an object
- Colour type includes warm and cool colours; complimentary colours (colours on opposite sides of the colour wheel) (explained later in this chapter); analogous colours (neighboring colours on the colour wheel)
- Opacity

5.2.2.2.2 Secondary Visual Elements

Figure 5-3 illustrates some secondary elements. The secondary elements are:

- Shape
- Light
- Form
- Space
- Texture
- Sound

Secondary visual elements are constructed from primary visual elements; for example, the avatar's clothes are constructed from point, line and colour. To investigate secondary visual elements further, consider figure 5-11 from the quest 'The Party Never Ends'.

Figure 5-11 is a screenshot captured from a high angle; the gamescape consists of various objects such as large trees, a grass field, gigantic rocks, hills, the avatar and the flying monster Dragonhawk. The trees are designed from organic shapes including curved lines. If the trees are constructed from primary visual elements alone, they will look unnatural; they will look solid. The trees are fantastic in shape and size but require some attributes of natural trees to b believable. Even though they have a fantastic form, they are created from the shapes of leaves and stems. The trees are game objects which represent trees. They imitate trees in some respects such as their organic shape, mass, texture, etc. Arnheim (1954) suggests that visual perception starts with recognizing the structural features of natural

things; imaginary game objects need to mimic some organic forms to be recognised as a type of that object as found in the physical world. A tree in a digital game will have some features of real trees otherwise they would not be recognised as trees, as a concept. We would be unable to recognise fantasy trees in games as trees if we did not already have a close familiarity with real, or natural, trees. The simulations of trees in figures 5-8 and 5-11 clearly represent a tree and not a mass of vegetation.

> Vision deals with the raw materials of experience by creating a corresponding pattern of general forms, which are applicable not only to the individual case at hand but an indeterminate number of other, similar cases as well. (Arnheim 1974:46)

According to Arnheim, experience can be applied to visual interpretation in paintings and photographs; people interpret the meaning of a picture from the visual components of objects drawing on the sum of their previous visual experience. Each visual component in a picture is interpreted for meanings which, jointly, give meaning to the picture. It may not be possible to interpret a new object if lacking basic information and prior experience.

(a) Shape: Circle, triangle, and rectangle are the most commonly used forms to create objects. Arnheim's law of visual perception (1954:53) states that '… any stimulus pattern tends to be seen in such a way that the resulting structure is as simple as given conditions permit'; or to put it another way, a viewer will simplify an image as much as possible to its most basic forms. The screenshot in Figure 5-11 captures a third-person "camera" perspective from a high angle behind the avatar; objects are arranged symmetrically to the right and left sides ordered by size and shape; trees, likewise, are arranged in order of size to indicate distance from the avatar creating the illusion of depth and appearance of three-dimensionality. The trees are aligned on convergent lines penetrating the forest at a point where land and sky meet. The depth dimension governs the size of objects placed in the gamescape. Closer objects are clearer than distant ones; Arnheim quotes Lucretius and Leonardo da Vinci who observed that a building or a man seen from a distance will appear round in shape. Arnheim states that 'adistance weakens the stimulus to such an extent that the perceptual mechanism is left free to impose upon it the simplest possible shape – namely, the circle (Arnheim 1954:63). In figures 5-11 and 5-13, the leaves are of free shape, have no texture and few colours; they are created almost exclusively from basic shapes and lines; this is sufficient for players to imagine the image as referring to a tree by comparison with real leaves. They are formed by overlapping irregular shapes. Arnheim (1974) notes that the shapes of objects are defined by their boundaries. Complex objects are constructed from simple basic shapes.

Shape properties: Shapes can be defined in many ways:

- Type: square, triangle, circle, etc.
- Size
- Space: the area inside the shape
- Levelling and Sharpening: terms which describe perceptions of the structure of an object. Levelling is a reduction of tension in the visual pattern which means, for example, that a complicated shape is reduced to a simpler shape. Sharpening is an increase in visual tension of an object by the addition of more detail to make a shape clearer. In figure 5-8, the shape of the decoration on the avatar's clothes illustrate a reduction of tension or levelling. Figures 5-7 and 5-13 illustrate both levelling and sharpening in the visual patterns of the leaves on the trees. In figure 5-11, shapes of the leaves have been leveled by decreasing detail; the outlines of the trees have been sharpened. Arnheim coined the term 'leveling' to describe procedures such as '… unification, enhancement of symmetry, reduction of structural features, repetition, dropping of nonfitting detail, elimination obliqueness. Sharpening enhances differences, stresses obliqueness (Arnheim 1974)'.
- Similarities and Differences: objects with the same shape may differ in other attributes such as colour and brightness. Both similarity and differences can be used to classify objects; for example, objects with the same or similar colour tend to be grouped in particular locations known as 'spatial locations'.

Objects can be organised through the visual properties and attributes of their shapes and other visual elements including form, colour and texture. Arnheim classifies shape properties into two types: boundaries (line, mass and volume); and the structural skeleton. However the properties and attributes of shapes are defined, definitions employed in computer graphical software will dominate.

Designers generally try to use properties and attributes of shape to mimic both natural forms and human perception. Digital game design is subject to limiting factors which can hinder this objective. One is limitations of computer memory and data transmission systems. Designers must take into consideration the restrictions on memory imposed by servers and home computers; likewise, download time – dependent on transmission limitations and players' home computers – must not be excessive especially since games are a commercial product. Designers must also consider their own time; it may take more time than is commercially practical to design a 'perfect' product. Designers must compromise to comply with these limitations.

Figure 5-13 Extremely long shot at high-angle perspective

Designers will normally compromise on visual design elements. Such a compromise is illustrated in figure 5-13. The "camera" has been moved to a high-angle perspective. The mass of leaves is in the shape of a cube designed on several planes; this saves time and memory and makes the game a practical proposition. There is a difference between "good", fantasy design and poor design. Having to compromise does not have to result in poor design; there are ways to hide the necessary compromises. Why is the tree in figure 5-13 an example of poor design? The answer is that "poor" design distracts the player and breaks his or her concentration. Fantastic design elements are believable within the context of the game but poor design elements are not. If the player's attention is broken, the flow of the game will stop and players may leave the game.

(b) Form: Form is a visual element; it refers shapes combined with other elements including texture and colour. 'Form is the visible shape of content (Ben Shahn).'

Three-dimensional graphical software provides basic forms such as Box, Sphere, Pyramid, GeoSphere and Plane (see figure 5-14); for designers, they are the basic visual elements to create models of game objects; textures can be assigned to them to simulate realistic objects. The basic forms are combined to produce props, sets and the gamescape.

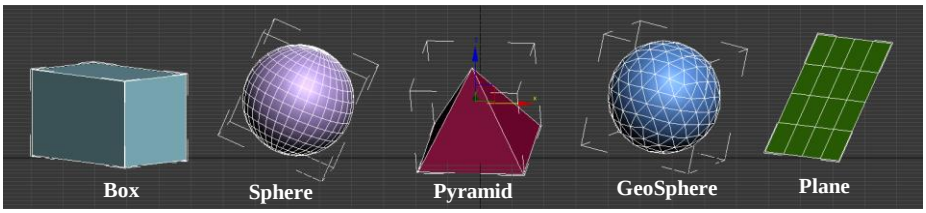

Figure 5-14 Basic forms in the 3D software which are initially used to create various objects

Designers use distinctive forms to create objects which are then arranged in the gamescape. Different territories in the gamescape have different types of objects. Players interpret meanings of visual content such as objects in the context of the themed territories in which they are located: Eversong Woods, Scar Dead, Silvermoon City and so on. The meanings of the territories are conceptual and constructed from the individual meanings of small objects. Eversong Woods, for example is a forest whose meaning is built from many small meanings such as tree, grass, animals, creatures, etc. which are created from distinctive forms. Designers project texture onto the form of an object, a process known as 'mapping'. Mapping makes objects look real. At this stage, the object is a model. Models are objects created in graphical software from basic visual components; they can be modified further, for example by projecting texture or colour onto them to create game objects. Models can be positioned in the gamescape; the gamescape itself is also a model.

Consider the leaves on the tree in figure 5-13. Designers will often project leaf texture onto a plane and then compose the shape of the whole mass of leaves for the tree. The projection provides content for the gamescape and establishes whether the meaning is real of fantasy. Careful examination of figure 18 reveals that the designer has made a mistake. The texture of the leaves looks like overlapping boxes which is unnatural. These unnatural shapes distract players during gameplay and add confusion to the internal reality of the gameplay. There is an argument that the game is a fantasy world; why should it objects look natural? The game and natural worlds are different. Artificial worlds in a story, science fiction, films or games are believable according to their own premises; if the premises are broken, the artificial world will disintegrate; the internal sense of reality has to be maintained. The unrealistic leaf mass of the tree in figure 5-13 add no meaning to the game and is, therefore, a distraction. According to gestalt theory, meaning as a whole is the sum of small parts; the mass of leaves is built from individual leaves.

(c) Space Designers arrange objects in the gamescape to construct a territory. Territories are where the game is played. The space of play exists not only in the

virtual word but in the physical world too, where players sit in front of their hardware. Katie Salen and Zimmerman describe space in a game thus:

> The concept of the space of possibility not only bridges the distance between the designed structure and the player experience, but it also combines the key concepts we have presented so far. The space of possibility is designed (it is the space of all possible meanings), it is a system (it is a constructed space, a context), it generates meaning (it is the space of all possible meanings), it is a system (it is a space implied by the way elements of the system can relate to each other)), and it is interactive (it is through the interactive functioning of the system that the space is navigated and explored) (2003:11)

Katie Salen and Zimmerman, therefore, define game space as a space of possibility, designed to generate meaning from a system of elements through interactive functions; game space means more than visual space.
Michael Nitsche (2008) suggests that we cannot limit game space by building a framework but he argues that it is better to define the frame by argument and context. He does not refer to Salen and Zimmerman but his criticism is of their kind of framework. He does, nevertheless, claim that game space is the space of action. He proposes five main conceptual planes for the analysis of game spaces:

- ‘**rule-based space** as defined by the mathematical rules that set, for example, physics, sounds, AI, and game level architecture;
- ‘**mediated space** as defined by the presentation, which is the space of the image plane and the use of this image including the cinematic form of presentation;
- ‘**fictional space** that lives in the imagination, in other words, the space “imagined” by the players from their comprehension of the available images;
- ‘**play space** meaning the space of play, which includes the player and the video game hardware;
- ‘and **social space** defined by interaction with others, meaning the game space of other players affected (e.g., in a multiplayer title)’ (2008:14-15)

For the practicalities of this study, the game space is divided as follows:

- **Physical Space**: the playing ground in the real world where players sit and play the game, including where players discuss game set up and activities.
- **Virtual Space**: Virtual space in the game world created from game objects and programming; it is the space of representation.
- **Imagination Space**: the space that players construct for themselves; it is the way that players perceive the game in their own imagination. It overlaps with Physical Space and Game Space; it can be called the ‘in-between space’.

In this study, I place Virtual Space as one of the game's visual elements. Virtual Space allows players to walk into, fly through, and dive into the gamescape as illustrated in the montage of screenshots in figure 5-15. Players have the authority to decide which way to go and where to move to pursue their quests. Three-dimensional Virtual Space is subject to gravity which is one of the game's mechanisms; it simulates the real world; for players the gamescape is more real than the physical world while they are playing. Due to gravity, players can fall; gravity limits a player's capacity to climb a mountain. The game's mechanics create a feeling of reality in which they are immersed; they create a feeling of 'being there' or 'self-presence' (Vorderer and Bryant 2006).

The third-dimension allows players views and movement through 360° vertically and horizontally. Players can relocate ('teleport') to remote game territories via a magic door, thus enabling and encouraging them to play faster and longer. The gamescape layers in figures 5-3, 5-7 and 5-8 establish a sense of depth through overlapping and scaling. The third-dimension; the interaction between player and game; and the opportunity to do things impossible in the real world differentiate games from other media. The game provides a map to prevent players from getting lost and achieve quests quickly. The game's mechanics and visual elements set up a reality different from the physical world; achievement and rewards help players to enjoy the game. Imagination Space is dynamic. Physical Space refers to location where the player plays, his hardware and his contact and communications with other players even if they are remote; the 'real world', or 'physical world' refers to everything, outside of the game, relating to real life.

Figure 5-15 Playing dimension in WoW

Imagination Space is the personal property of the player. Imagination Space is constructed from experience of the real world and experience in the game world. Sometimes players give objects meanings which are different from those of the real world. When a player is deeply immersed in his or her play, the Physical Space and the Virtual Space can merge. Tom O'Dell and Peter Billing, in their book 'Experiencescapes' (2005), wrote about how people experience landscape; he did not write about gamescapes but his ideas can be applied to digital games. He refers to landscapes as 'expereincescapes' or 'landscapes of expereince' which people encounter physically in their everyday lives. He notes that an individual's experiences can be 'contrived, formulated and arranged for consumption' in different places. Our experiences of landscapes and buildings are structured by our perceptions drawn from previous experience and our culture and what we have been taught; experiences continue to be formed after consumption. O'Dell and Billing introduce a spatial component; the discuss organization and space in landscape and inside buildings. Their concept of expereincescapes that places shape people's perceptions can be applied to game spaces; conversely, game spaces provide visual experiences and these experiences depend on immersion. Mäyrä and Ermi (2005) classify immersion into three types:

- a sensory type which directs stimulus from the game world to the player
- challenge-based interaction which the player gets from gameplay
- an imaginative immersion where players create their own fantasy world from a whole meaning of the game components

Sense of immersion is created through interaction and imagination. Imagination is the feeling of being there, in the game world. The game provides objects, constructed from basic visual elements, for interpretation. Basic visual elements provide reference meanings; these meanings can be 'real' in the context of the game and/or real in the real world. The meaning of a real world object can be created in a game object through construction of shape, form, colour, texture, lighting and sound.

(d) Textures Objects require textures to make them appear realistic. In plate 5-1, various textures were projected onto the surfaces of props and sets to make them appear realistic; for example, the mat in figure 5-2 has had a large texture pattern, drawn from colours and lines, projected onto it. The avatar's clothes, the flags and cushions are decorated with ready-made patterns to look like textiles. Some texture is finely designed but some is rough in appearance but can still look good on distant objects; texture in games is an illusion. This kind of mapping of texture can also be seen in plate 5-2; the ground in Hellfire territory is fully mapped with a large area of red-soil texture; the area thus mapped represents dryness and toxins so that no plants can survive.

Texture is a pattern on a surface. In digital games, patterns are projected onto the surface of two-or three-dimensional objects. Texture is a complex form combining various visual elements. Texture properties are the same as other visual elements: line, shape, form, colour, etc. Natural textures can be applied to game objects and gamescapes. Texture quality depends on the quality of the visual components; textures have some common properties: size, scale and value. Designers use computer graphic software to apply by mapping. Attributes of texture can be adjusted: colour, size, opacity, diffusion, etc. Texture in World of Warcraft imitates the real world to create an illusion of reality but low modality results in rough textures. Real textures cannot be employed because of technological limitations. In plate 5-2, ground and sky textures establish the game environment. Texture requires another basic element: light.

(e) Light Light in World of Warcraft is artificial and is generated by hardware and software. As illustrated in plate 5-1, light intensity differs between exterior and interior settings. The main source of exterior light is the sun; it gives a harsh light and strong shadows; figure 8 displays the shadows of trees and mountains. Figure 5-16 shows interior lighting from different sources:

(a) wall lamps
(b) window glass; some objects can emit light including window glass in this illustration
(c) stand lamps
(d) floating lamps; ceiling beam

Some areas of interiors are illuminated but lack any apparent source. They may be fake lighting created by the designer and which can disappear.

Figure 5-16 The light sources in the plate 1 of WoW gameplay

In figure 5-12, lights represent the power of the Blood Elf race; they include coloured lights which may be of contrasting colours. The contrasts between violet, orange, bright green and white are an indication of the power of their spells.
In the gameplay in plate 5-2, light on the ground is of minimal intensity whereas in the sky it is of high intensity and bright (mixed with white). The light in the sky is aesthetically pleasing; the dull lighting on the ground represents a toxic environment which is unsafe for the player.

Plates 5-1 and 5-2 of 'Colour Usage in World of Warcraft' (Figure 5-12) illustrate several means of lighting; the main source is the sun; there are artificial lights such as lamps; magic power, etc.; and there are objects with their own illumination.

Light is a secondary visual element. Light is a form of electromagnetic radiation within a particular range of wavelengths and displayed on a monitor. Light is required for illumination. Light can direct the eye; create viewers' moods; display depth (illusion of three-dimensionality); be an element of composition; and convey time (day or night, for example) (Kars Calahan, Carson & poster 1996). Light has various properties associated with other visual elements; the most common of these properties are: direction, range, colour, intensity.

Gallardo (2000:7-10) classifies the properties of light into ten components: they are slightly applied in this study because they are part of physics but they are mentioned because game designers and readers of this research need to be aware of them:

- **Reflection.** Reflection is the throwing or bouncing back of light as it hits a surface.
- **Refraction.** Refraction is the apparent bending or turning of light as it crosses from one medium to another; for example, in passing from air into glass or water, light gets bent.
- **Transmission.** Transmission of light is the conduction or conveying of light through a medium.
- **Interference.** Interference is the wavelike interaction of light that results in amplification, cancellation or composite generation or the resultant wave.
- **Scattering.** Scattering is the spreading or dispersal of light as it interacts with matter or media. It is the multiple reflection of light in different directions.
- **Diffusion.** Diffusion is the even scattering of light by reflection from a surface. Diffusion also refers to the transmission of light through a translucent material.

- **Absorption.** Absorption is the nonconductance or retention or retention of light by a matter or media that does not result in either reflection or transmission.
- **Polarisation.** Polarisation is the selective transmission of light based on its orientation. When light is reflected or refracted its orientation and alignment change.
- **Dispersion.** Dispersion is the effect of light being separated or broken into different wavelengths because the light passed through a second medium that has a different refraction index from the first. This is the common prism effect or grating effect. To work, dispersion requires the presence of two different media. It is the change in the index of refraction as a function of the wavelength in a transparent medium.

Gallardo describes the physical properties of light used in computer graphics. Lighting used in World of Warcraft is simulated light created by software; some light properties have limited application in software; light created by software cannot be treated as having the same properties as light in the real world. Light is an important element for creating illusion in the virtual world but designers simulate light's physical properties to create realistic-looking environments. Light is always associated with texture. Some attributes of light can be adjusted can be adjusted in three-dimensional software: light sources, types of lighting, intensity, colour, shade, attenuation, shading and shadow.

(f) Sound All visual elements described so far can be seen by human eyes. One visual element cannot be seen; sound. Although it can be argued that sound is not a visual element, it is conventional, in the study of games, to treat it as one; sound is so inextricably linked to moving images that it is convenient consider it a visual element. Sounds represent imagery. The primary role of sound in digital games is interactivity; in this respect, it is different from other media. Sound is also employed to help give players a feeling of immersion in the game and for continuity.

Sounds are necessary for realism. Sounds also aid continuity of gameplay and immerse players in emotions. Collins (2008:137) notes that:

> Many role-playing or Sims-style games as well as online games have extended lifetimes, where players typically save and come back to the same game over several days, weeks, or even months. The use of sonic symbols is particularly is particularly necessary in these games to provide a sense of cohesiveness, and to help guide the player along in terms of the narrative and his or her location in the game matrix.

To investigate the sound, we can start from the first example of the gameplay, the quest 'Defending Fairbreeze Village' (the first gameplay video-clip).

In plate 5-1, the sound in the video-clip can be analyzed and classified into various types of sound which are:

(The number in blankets show the time range when the sounds are existed)

- the background music
  Play time: 00.00-00.03s, 00.18-01.24s, and 01:38-02.25s

- room tone (refers to a sound of location or space, it is a silence sound without dialogue)
  Play time: 00.00-02.25s

- the avatar turn left or right sound
  Play time: 00.03-00.07s, 00.11-00.12s, 00.22-00.23s, 00.31-00.35s, 00.38-00.41s, 00.48-00.58s, and 0015-00.16s

- the footstep sound when the avatar runs or walk
  Play time: 00.09-00.19s, 00.25-00.44s, 01.00-00.02s, and 01.07-00.11s

- the animal(cat) footstep
  Play time: 00.03-00.09s, 00.20-00.23s, and 00.59-01.07s

- the animal sound from outside
  Play time: Tiger Blade (00.12-00.1s3, 00.21-00.22s), and birds sound (00.06-02.25s)

- the sweeping sound from a broom
  Play time: 00.16-00.19s, 00.27-00.47s, and 01.18-01.58s

- the closing and opening backpack sound
  Play time: 00.00-00.03s, 00.54-00.56s, 01.13s, 01.25s, and 01.32s

- the environment sound
  Play time: wind (00.03-00.18s, 00.32-00.41s, 01.14-02.25s), water (01.13-02.25s)

- the menu opening and closing sound
  Play time; 00.37s, 00.40s, and 02.21s

- and selecting sound
  Play time: 01.47s, 01.59s, and 02.03-02.15s

Types of sound can be categorized as (Collins 2008; Childs 2007:133-137):

- **Ambient**: an acoustic environment which increases atmospheric character: for example, birds singing and wind blowing.
- **Foley**: sounds relating to a particular environment such as footsteps, windows opening, typing, etc.
- **Sound Effects (FX)**: artificial sounds which are created and simulated to expand an event such as gunshots, engines and explosions.
- **Music Score**: background music or soundtrack such as simple melodies known as videogame music.
- **Voice**: dialogue such as speech, yelling, screaming and so on.
- **Sound Design**: synthesized sounds

These kinds of sound are based on cinema sound design techniques, adapted for video games. Sounds in the first sample can be classified as follows:

(a) Ambient
- Room tone
- Atmosphere (environment sounds)
- Wind

(b) Sound Effect
- Animal sound (Tiger Blade, birds)
- Broom sweeping
- Water
- Sound design (synthesized sound)

(c) Foley
- Foot Step (avatar runs or walks)
- Prop sounds (closing and opening backpack, the menu opening and closing, and clicking)

(d) Music Score or Video game music

All sounds are played when the avatar, or any character, is in action except background music or video game music played on loop. Game (background) music and room tone are played as the basic sound for all gameplay. The sound of a broom sweeping becomes louder as the player gets closer. To investigate further, we need to analyse more gameplay.

The gameplay videoclip (Fly with master licence) in plate 5-2 is the next example of sound analysis; this gameplay clip has different sounds. The videoclip can be

analysed by sound type and classified according to the components of each sound. The results are shown below.

- the background music (sound design)
  Play time: 00.00-02.22s, and 02.23-03.49s

- room tone
  Play time: 00.00-03.49s

- the environment sound (wind)
  Play time: 00.30-00.45s, 00.38-02.22s, and 02.37-02.49s

- the avatar turn left or right sound
  Play time: 00.11s, 00.21-00.24s, and 00.54-00.56s

- the footstep sound when the avatar runs or walk
  Play time: 00.01-00.11s, 00.17s, and 00.56-01.00s

- the animal sound (Blue Wind Rider)
  Play time: 00.28-00.29s

- the animal footstep (Blue Wind Rider)
  Play time: 01.32-01.45s, 01.50-01.53s and 02.50-03.24s

- the animal flying (wings flapping)
  Play time: 01.53-02.49s, 01.50-01.53s and 03.25-03.43s

- the NPCs dialogue
  Play time; 00.13, 00.20s, 00.25s, 00.37-00.40s and 00.54s

- the new ability (Flight Master's License training)
  Play time: 00.16-00.17s

- the closing and opening backpack sound
  Play time: 00.00-00.03s and 00.39-00.54s

- the menu opening and closing sound
  Play time: 00.00-00.04s, 00.19s, 00.54s, 01.02-01.12s, 01.21s, and 01.25-01.27s

- the map opening and closing sound
  Play time: 01.46-01.50s,

- Drinking water sound
  Play time: 01.06-01.07s

- Bread harvesting sound
  Play time: 01.16-01.17s

- Discovery new territory sound
  Play time: 02.38-02.40s

- Giant robot footstep (lo-fi sound)
  Play time: 03.07-03.49s

- and selecting sound
  Play time: 00.12-00.15s, 00.26-00.34s, and 01.18-01.19s

Sounds in the second sample can be categorized to the sound type in following:

(a) Ambient
- Room tone
- Atmosphere
- Wind

(b) Sound Design
- Beam ward
- Menu pop up & Order

(c) Dialogue
- NPCs dialogue

(d) Sound Effect
- Animal Roar
- Giant robot footstep
- The new ability (Flight Master's License training)
- Discovery new territory sound

(e) Foley
- Foot Step
- Animal flying (wings flapping)
- Animal footstep
- Foot Step (avatar runs or walks)
- Prop sounds (closing and opening backpack, the menu opening and closing, and choosing)
- The map opening and closing sound
- Bread harvesting sound
- Drinking water sound

(f) Music Score or video game music

This sound analysis shows that sounds are not associated only with game objects but are also connected with player interaction: for example, footsteps when the avatar moves and the voices of NPCs when the avatar interacts with them. Sounds

such as ambient sound and music score are also associated with different places. There are different ambient sounds between interiors and exteriors.

Many scholars, such as Peerdman (2006) and Collins (2008) have given attention to sound as a visual element in digital games. Collins (2008) suggests that music improves the structure of a game, for example to bridge different scenes. He borrows two concepts from as laid out in table 5-1.

Table 5-1 Sound in games (adopted from Collins, 2008)

<table>
<tr><td rowspan="3">Diegesis – sounds whose source is visible, or off screen but implied to be present on screen, for example actors talking, sounds made by objects or music being played on instruments</td><td colspan="2">Nondynamic – the sound occurs in the character’s space but the character has no direct participation in it</td></tr>
<tr><td rowspan="2">Dynamic – the character participates directly in the sound</td><td>Adaptive – sound from the reaction of game states such as warning sound</td></tr>
<tr><td>Interactive – sounds of players’ interactions with game objects and interfaces.</td></tr>
<tr><td rowspan="3">Nondigesis – sounds whose source is neither visible on screen nor implied in the action for example narration, added sound effects and mood music.</td><td colspan="2">Nondynamic – the sound occurs in the character’s space but the character has no direct participation in it</td></tr>
<tr><td rowspan="2">Dynamic – the character participates directly in the sound</td><td>Adaptive – sound from the reaction of game states such as warning sound</td></tr>
<tr><td>Interactive – sounds of players’ interactions with game objects and interfaces.</td></tr>
</table>

Sounds are significant in creating the illusion of the third-dimension. When a player runs or walks, the sound of the footsteps and the camera shaking imitate the real world. Gee (2007) mentions that:

> *… the effective thinking is more like running a simulation than about forming abstract generalizations cut off from experiential realities. Effective thinking is about perceiving the world such that the human actor sees how the world, at a specific time and space (as it is given but also modifiable), can afford the opportunity for actions that will lead to a successful accomplishment of the actor's goals.*

Sound in World of Warcraft consists of:

- Dialogue
- Music
- Ambient Sound
- Sound Design
- Foley
- Sound Effects

Collins (2008) classifies the properties of game sound into tenth variables which a composer needs to distinguish sounds. They are:

- Tempo – level or speed
- Variable Pitch – transposition
- Variable Rhyme – meter
- Variable Volume/Dynamics
- Variable DPS (Digital Signal Processing)/Timbre – digital sound signal
- Variable Melodies
- Variable Harmony (keys and chords)
- Variable Mixing
- Variable (open) Form – random sequence of music
- Branching Parameter Based Music and the Transition Matrix – the game software provides music appropriate to what is happening in the game

The above sound properties will not form part of this research.

World of Warcraft has multiple channels through which players can hear NPCs and to communicate player-to-player. These dialogues help to keep players playing and help them not to feel they are alone even when playing individually. Collins (2008:132) notes that 'Part of the role of dialogue – and audio in general – is the suspension of disbelief, adding realism and creating illusion. The illusion of being suspended in a three-dimensional atmosphere is greatly enhanced by the audio,

particularly for newer games that may be developed in full surround sound, although even more simple stereo effects still have a considerable impact.'

Each race of avatar has its own language; for example, Blood Elves speak Elf, but when they speak to humans, it is translated into a human language. Applying sound to a game creates a sense of immersion; Zehnder and Lipscomb (2006) make the point that music in digital games can serve crucial technical, aesthetic and emotional functions to enhance continuity and the sense of presence.

5.2.3 Visual Operator Principles

As already mentioned, visual elements require rules and principles to organize them. These principles are used to assemble visual structures and patterns, for example by balancing contrast in the colour themes. Other principles create the illusion of movement of objects and can control their direction. These are 'Visual Operator Principles'. Visual Operator Principles regulate and combine visual elements allowing interpretation in the game environment; they are design tools developed in other disciplines. Visual operators perform on the Expression Plane and cooperate with game mechanics.

To investigate visual operators, we need to recover the quest 'Defending Fairbreeze Village.'

By applying the layer system to figure 5-2 in plate 5-1, the landscape was divided in two; the avatar as centre of interest. One part is the floor area from the avatar to the wall; the second is the wall. Props are distributed around both parts. Objects can be separated according to position; one group is located in the middle of the room and the other close to the wall. Both groups contain static and dynamic objects. If the arrangement of the objects in the landscape is not organised, but scattered, the viewer will not be led to the centre of interest. Arrangement in groups helps to locate objects during the game. Object alignment helps create patterns and spaces and visual direction which guide the player whilst playing. The player can interpret visual alignment to obtain useful information during play. The repetition of visual patterns on the floor and wall also help mark direction (pattern direction). The patterns help create a sense of movement; the sense of movement is also created by movement of NPCs and game objects such as the besom, floating trees, cats running, etc. Movement helps create a sense of place. Object alignment crates direction, as do other properties of visual elements such as size adjustment and hue.

We follow the avatar's movement inside the gameplay, ascend to the floating floor, exit the building, enter and descend to the ground floor. The avatar stays in the centre of the screen, in third-person perspective for most of the play apart from during 00:00:23-00:01:01. Third person perspective is more comfortable than any other; the player (here it is me) can clearly see the private area close to the (i.e. my) avatar. All through the gameplay there are sounds; game music, room tone and

ambient sound establish the atmosphere of the environment whilst sound design and Foley provide the senses with movement and reality. Sound stresses the objects' presence.

In one part of the quest the player has to slay four Darkwraiths (members of the Darkwraith clan) in the Dead Scar sub-territory of the Eversong territory. Figure 5-17 of the gameplay can be divided into three layers around the avatar's position, the centre of interest:

Frontal Layer:	the green hill from the bottom of the screen to the avatar
Middle Layer:	includes Dead Scar from immediately beyond the hill to the dark ground across the river
Background Layer:	includes the light blue area beyond the dark area across the river to the deep, dark forest

.

Figure 5-17 The shot of the quest 'Journey of Defending Fairbreeze Village 2'

The three layers can be considered as sub-territories. They are marked by differences of geography and colour. The Frontal Layer, a part of Eversong Woods,' is a hill covered in green grass. Dead Scar, the Middle Layer, has black soil, bones including skulls, and rocks; it is low-lying land. The Background Layer, a sub-territory called the Ghostlands, is covered in giant trees and blue grass. The three sub-territories are distinguishable because of texture, colour and tree design. The different visual characteristics of each sub-territory ensure that players are

aware of their position in the game territory. Each sub-territory has its own colour and textural theme.

Colour can highlight interaction, for example when the avatar is attacked by a Darkwraith, the Cycle Star appears above the avatar's head to emphasise the stunning situation. Colour is also applied to death scenes as when the avatar dies and becomes a spirit (00:03:11-00:03:14); the white light and transparent objects represent the spiritual world which only the avatar can enter; sounds, likewise, change from music and dialogue to wind blowing with the death of the avatar.

Dialogue, ambient sounds and sound effects all enhance the experience for the player, especially during a battle when the avatar is attacked. Players experience excitement, emotion and anxiety; when a player is attacked, settings of the Colour Bar change to reduce levels of green – green represents life and if it is reduced, life is threatened causing players to experience fear. In the last scene of this gameplay, when the Colour Bar predicts that he or she cannot will, he, or she, decides to run away. Red text floating above heads warns of dangerous opponents including monsters; players can decide to fight or run away.

Movements of the slain Darkwraiths help sustain visual dynamics; a screen without movement will bore the player. Music score and ambience are important for creating dynamics.

In this study, visual operators will be classified as follows:

- Balance
- Emphasis
- Movement or Rhythm
- Dynamics
- Perspective

5.2.3.1 Balance

As shown in the above analyses, Balance is an important visual operator; it organizes visual operators on the Content Plane. The Balance operator works on the Expression Plane. Balance works with other visual operators such as movement and dynamics. For Rollings and Adams, (2003:252-278) '… game balancing is a problem involving a fantastically large number of visual variables. It's an optimization problem in *n*-dimensional space where *n* is a very large number, … The objective of balancing a game is to provide a game that is internally consistent and fair, without allowing players to exploit flaws and weaknesses to gain advantages. The other aim (of course) is to make sure that the game is fun.' Balance aims to maintain equilibrium in the game. There are two types of balance: static and dynamic. Static balance refers to the rules of and interaction with the game. Dynamic balance maintains player interaction and adapts the game to

players' skills and abilities. Both Static Balance and Dynamic Balance are required to maintain a game (Rollings and Adams 2003:277).

Rollings and Adams suggest state that balance is achieved when dynamics are maintained in equilibrium. However, in the opinion of this writer, 'balance' is not only balance in the game mechanics (i.e. in programming) but there is also balance in visual representation and interaction – good composition and design themes for each territory. Visual design is concerned with object position, size, scale, colour, time, space, etc. which are associated with balance in game mechanics. This writer considers that, to avoid players losing interest, designers must balance factors such as how often objects appear; how many objects there are; where they are; and the number of player interactions with objects. Object generation is associated with time and space in territories to maintain player interest. Composition of visual objects that players interact with is regulated by visual operators.

In the second sample of gameplay analysis, 'Journey to Defend Fairbreeze Village', players perceive size and position of objects even though they are never stationary in the gamescape. Darkwraiths (monsters) always move backwards and forwards between two points repeatedly, this being a feature of game mechanics. According to the investigation of movement of game objects in WoW, 'Dynamics' helps create balance in the game; for example, when one object moves away from a location, another will move in. The continuous replacement of objects presents the player with new visual experiences; players have to learn to deal with the filling of the space of monsters and find opportunities to enter the space safely. This object replacement is organized by game mechanics. Dynamics is created by a 'visual force'; Arnheim (1974:11) notes that 'visual force' derives from interplay of 'tensions' inherent in size, shape, location and colour; 'tensions' can be described as 'psychological forces'. These 'forces' push players to continue playing; these 'psychological forces' are the product of visual elements, storyline and interaction through which players gain experience.

Figure 5-18 Unbalancing of visual form in the monster

Game territory is not static but is continuously dynamic. Game design must take into account visual balance in terms of spacing, rhythm, movement, shape, direction, isolation, weight and interaction. Games are generally designed through their landscapes, props and sets which are designed for participation and for players to interpret for meaning; therefore, analysis can start with examination of visual composition, such as how visual objects are organised in the landscape to create balance. Movement and interaction can be analysed from video clips of gameplay. Objects may attain balance through their form; for example, a tree achieves balance through its symmetrical shape. An unbalanced object, such as the monster's shape in figure 5-18, may present a clue in the game (this screenshot is taken from the gameplay video clip of the quest Spinal Dust at 00:00:09). In the game, monsters exist in a variety of shapes and designs. Each monster's design is unique using the balance/unbalance principle. If everything is balanced, it will be boring; an unbalanced object, therefore, can, paradoxically, create balance. Balance can be achieved through other visual operators and from game mechanics such as the quest by an individual player; a cooperative quest (by a 'guild') in which individual players take on different roles such as warrior or healer to help each other achieve the same goal. The death penalty is a solution to a problem with game balance by forcing players to improve their play (Klastrup 2008; Rollings and Adams 2003).

Balance within the whole gamescape is achieved through visual elements, interaction and storyline. As shown, Arnheim (1974:28) notes that one factor may act with or against another to create balance of the whole; weight through colour may be counteracted by weight through location. In World of Warcraft, balance is often achieved by opposing tendencies of the visual operators. The balancing operator not only balances visual design but draws attention to the object. World of Warcraft is sometimes unbalanced due to poor design and repetition in similar quests.

5.2.3.2 Emphasis

The gamescapes of some World of Warcraft territories contain too many objects, disturbing players' visual fields; players may become confused so that they lack judgment. They may get lost in the game environment. Good visual composition is required to highlight the centre of interest. Stressing the dominant object helps players focus on the centre of interest. To emphasise a visual object in the gamescape, designers need to integrate visual elements and operators to lead players' eyes to the right targets. Players can be directed by contrasting visual elements; for example, in figure 5-19 of the videoclip 'Suncrow Village', at 00:01:52, in the Ghostlands territory, shows dark and unclear objects representing danger in a dead zone. The unclear environment creates problems for players if they have to travel through this land; it would have been better for the designers to have warned of the danger through contrasting colours.

In figure 5-19, the light green path invites and guides the player. Contrasting visual objects can emphasize a pathway; contrasting visual elements, likewise, provide

emphasis. In 'Suncrow Village', the colours of the giant spider which rules over the sub-territory make it stand out from its surroundings. Its fighting skill and battle power are high (00:05:00). Within the screenshot, the differences of the spider's visual elements from its surroundings, especially colour, emphasise the danger; conversely, the similarity of the colours to those found elsewhere in the game, where certain colour codes apply, also warn of danger. High volume sound can be used to attract the players' attention; it is another example of the principle of difference as a visual operator.

Emphasis can also be applied to movable objects such as NPCs and monsters; they can be given unusual attributes in the design of their walking posture and gestures. The monster in figure 5-18 has a posture found only in monsters of this kind; other kinds of monsters, equally, have their own characteristics. The emphasis on posture is important because of the way it show up when the monster moves, providing a visual clue for the player. Here, the emphasis of the operator is on movement helping to create the dynamic game atmosphere.

Figure 5-19 the visual environment of Ghostlands

5.2.3.3 Movement and Rhythm

Nitsche (2008:33) states that '[movement] a ubiquitous form of interaction in navigable virtual worlds but it remains an abstraction that differs significantly from movement in the real world.' 'Rhythm', as movement, is defined as 'arranging a visual composition such as the repetition of object placement, colour changing, light and shadow movement, etc. Game designers create movement in two ways:

- by generating object movement from one position to another
- by creating a sense of movement through visual composition, for example by repeating shapes, colours, lines, spaces, lighting and textures.

In figure 5-20, the setting is the Hall of Blood in Silvermoon City. The sense of movement is created by animated objects like the blue fires in the middle of the room and against the wall. Movement introduces the additional factors of direction and speed; similarity and difference in speed help to define distance. The arrangement of the pillows creates a sense of direction and their spacing a sense of speed. The patterns on the floor also create a sense of movement by using thick curved lines, varying rhythms and alternating colours. The texture and patterns of the mural are drawn from lines creating direction, spaces and rhythm of movement and a sense of dynamics of the whole. The light and colour theme represents a mood of attractive power signifying magic and visual dynamics.

Figure 5-20 the Hall of Blood in Silvermoon city

5.2.3.4 Dynamics

Dynamics in visual landscapes is the sense of movement created by visual elements and game practices. It can be created when objects change position or properties. Animated objects are dynamic in two ways; the object itself moves; and organization of objects can create an illusion of dynamics. These two types of dynamics work together Visual dynamics, Arnheim (1974:67) argues, is a property inherent in shapes, colours and locomotion, not perceived by an observer who relies

on memories; the conditions creating visual dynamics derive from the object itself. The visual environment on World of Warcraft is created from imagery; it imitates the real world, including static and moving objects, and sound, and is three-dimensional. The visual environment is always dynamic.

During play, players see things moving; monsters are walking, flying or diving; the sky changes colour; background music is playing. In this dissertation, case studies will be used to investigate dynamics. This gameplay video clip was recorded in the Deatholme sub-territory (video link). Figure 5-21 shows the Deatholme lands; there are many objects in motion on the screen including poisonous smoke from the giant pot in the middle; moving monsters guard the tower; snow is falling; changing shades or orange colour the sky at sunset. These moving, changing phenomena create the illusion of visual dynamics. Players are an integral part of the dynamic process; they can control their avatar's movements, move objects and other movement onscreen may be a response to their actions.

Figure 5-21 Deatholme lands

When players walk their avatars in the gamescape, they feel that they are inside the game. Why? The main reason is that players experience movement and dynamics of objects within the enormous game environment; the experience gained creates frames of reference for players. This phenomenon confirms Arnheim's (1974:381) argument that:

A different concept can be conveyed by the film. The picture taken by a camera that travels along the street does not produce the same experience we have when we walk in the street ourselves. Then the street surrounds us as a large environment, and our muscular experience tells us we are in motion. The street on the screen is a relatively small, framed part of a larger setting, in which the spectator finds himself at rest. Therefore the street is seen as moving. It appears to be actively encountering the spectator as well as the characters in the film, and assumes the role of an actor among actors.

In Hitchcock's film 'Rear Window', one character observes another character through his window and from a high angle; he observes her not only through his window but hers also. He takes on the role of audience with us to watch the action through two windows; the windows can be seen a metaphor for the cinema audience who are always observers and never participants. Digital games are different from film. The audience participates in the action; their actions determine the plot.

Players interpret visual dynamics through a "camera"; of course, there is no camera but the digital view mimics the actions of a camera with different viewpoints, ability to move around and zoom in and out. Players can choose between first and third person perspectives providing different visual experiences.

5.2.3.5 Perspective

Choices of perspective determine the frame for players' perception of the gamescape. It is like a window through which all interaction with the game world takes place. Perspective is controlled by "camera" framing, "camera" angle and "camera" movement. When the "camera" "sees" through the avatar's eyes, it is called 'first-person perspective'; alternatively, if the "camera" moves out of the avatar's eyes, it is called 'third-person perspective'. In World of Warcraft, camera position is optional and players can change perspective at any time during gameplay. The camera can rotate, pan, tilt and zoom. Strictly speaking the camera does not zoom in and out; the effect of zooming is achieved by moving the camera closer to or further away from the subject. This is illustrated in the video strip in plate 5-3, in the territory of Silvermoon City, the first city of the Blood Elf race. The video strip shows the effect of two perspectives in sixteen randomly selected frames. The game video clip (two perspectives in WoW) is five minutes long. The first frame is shot in third-person perspective; it is an extremely long shot at eye level; the frame sets the scenario in Thuron's Livery sub-territory; this perspective places the player at a distance from his or her avatar. The seventh to tenth frames are shot from in first-person perspective.

When the perspective changes to third-person (screenshots 11 to 16, 00:03:53-00:05:14), it has a feeling of being outside the game world, of being an observer, in contrast to the direct view through the avatar. In the third-person perspective (screenshots 13 to 16, 00:04:21-00:04:40 and 00:04:52-00:04:54), in some camera

positions, there are distractions due to leaves buildings and other objects which create difficulties during a battle. A feeling of detachment from the game can occur in both the Content Plane and the Expression Plane if there is no sense of "being there" in both the game world and the storyline. A player who is distracted has time to think about the reality of game objects; more typically, the camera is moved closer to the viewpoint of the avatar's eyes bringing us into the game world and storyline in which the player and avatar are the same being.

In first-person perspective, from frames 7 to 10, players see objects as if with their own eyes, thus creating a feeling of immersion in the game world. First-person perspective creates a feeling of 'being there" in the visual environment (Reeves 1991; Sheridan 1992; Riva, Davide and Ijsselsteijn 2009); in contrast, in third-person perspective, when the camera rotates with a long shot, views the whole landscape and the whole visual content especially from a high-angle perspective; this is a convenient way to control the avatar for a short time in a large space but it lacks precision.

Plate 5-3 Perspectives, camera angle and movement

5.2.3.5.1. Visual Grammar and First-Person Perspective

The video strip in plate 5-4 consists of twenty-four randomly captured frames from a video game twenty-six seconds long in first-person perspective. In first-person perspective, the "camera" is located in the avatar's eyes; the player confronts objects in the gamescape directly (Poole 2004). As a technological game, World of

Warcraft pits players and game, and player and player through interactivity and 'vividness' (Steuer 1992; Witmer and Singer 1998); it creates a sense of involvement and immersion; it has psychological effects; the essence of the game is 'telepresense' ('being there') (Tamborini 2000). Plate 5-4 was recorded from a gameplay scenario (video link) in the first playground of Sunrise Land, a territory of the Blood Elf race, a beautiful fantasy gamescape designed to give a good first impression to new players. The following describes the author's own feelings after playing in this gamescape:

> Playing in first-person perspective, I experience the game world similarly to using my own eyes. When I walk or run, I see objects which resemble those of the real world, such as trees, grass and road, moving towards me. Within the game, I am running along the path from Sunrise Hall to Silvermoon City. I can hear my own footsteps, background music, birdson and Springpaw (sabre-tooth tiger). I notice three or four kinds of grass including one with a yellow flower. I can see the leaves on a small tree waving in the wind which I cannot feel. The leaves of the big trees and vines are still. The wind blows some small flowers into the air from the grass and butterflies are flying. I see Springpaws and Tenders (tree monsters) walking in a field; some are lying down – they might have been killed by me or other players. When I stop and turn round, I have a strange feeling; I realise that the rectangular frame is not like the natural view from my own eyes and all movement is mechanical.

In the game, "seeing" with first-person perspective is not the same as using your own eyes; your own eyes continuously adjust focal length to see near and far objects. In first-person perspective, players cannot see their avatars' bodies. This is a major difficulty when fighting a battle due to lack of precision; the author failed in battle many times whilst in first-person perspective; if we cannot see things as a whole, as in the real world, we lose the target.

In first- and third-person perspective, players, in the form of their avatars cannot walk through objects such as trees; however, they can, in either perspective, walk through other avatars and NPCs as if they are not there. If a player wants to interact with another avatar or an NPC, first-person perspective is unsatisfactory because it is impossible to gauge distances especially when close to an adversary; it is necessary to use third-person perspective – the avatar will be in front of your eyes on the screen and you will be able to gauge distances.

In plate 5-4, the gameplay was recorded at 30 frames per second, producing 780 frames. During screenshots 1 to 5, the avatar is running forward. From screenshots 6 to 24, the avatar is turning to the left but the frame does not change. In frame 25, the frame jumps to, or catches up with, the avatar's view. Whereas forward movement is smooth and imitates the human eye, movement to the sides is jerky and not at all like human sight. In circular motion, there is a limited number of viewing angles. In other words, during forward motion, the every frame is

refreshed; during circular motion, there are certain angles which the motion has to reach before it will be refreshed. This phenomenon causes players problems.

5.2.3.5.2. Visual Grammar and Third-Person Perspective

In third-person perspective, the "camera" is not in the position of the avatar's eyes. Plate 5-5 shows a video strip in third-person perspective with various camera angles and framings (video link). This sample of 24 frames was extracted from 2040 frames of one minute and eight seconds of gameplay. The camera is behind the avatar; it starts in long shot below eye level and pulls back to extremely long shot at a high angle. The player controls the avatar to run forward with the camera following.

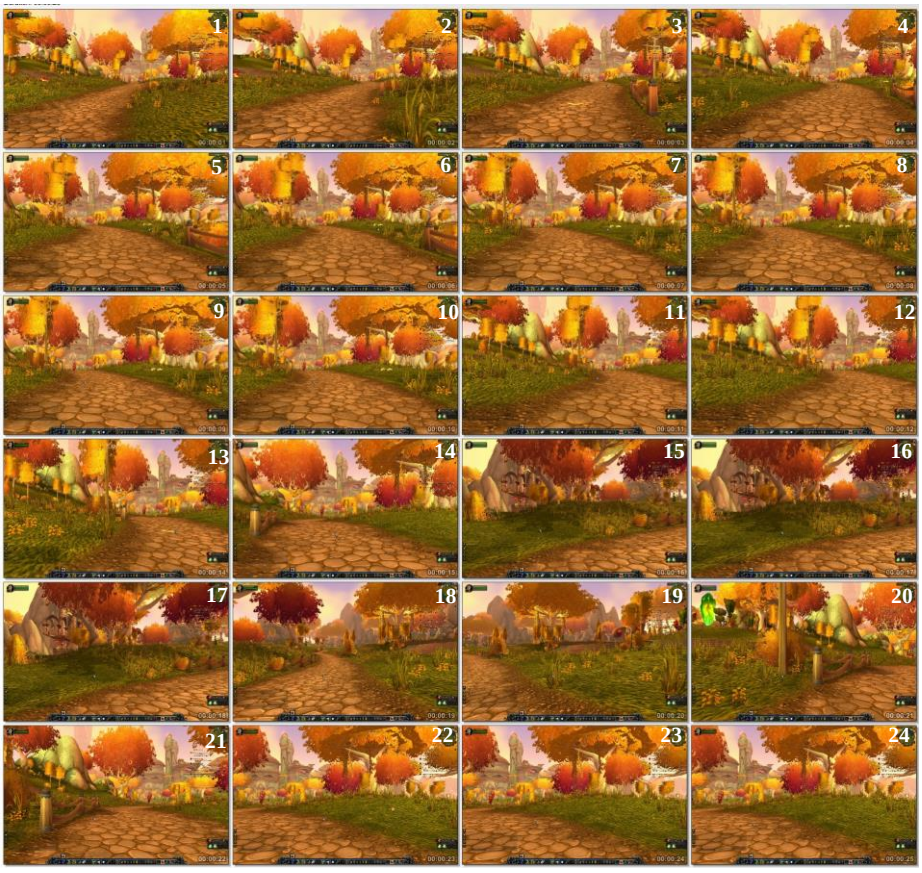

Plate 5-4 The first person perspective in the Silvermoon city

These screenshots show a broad perspective view of the visual environment. This kind of view creates a feeling of detachment from the game world. The avatar is much reduced in size on the screen and the player becomes more of an observer. This perspective allows the player to view elements and objects as a whole. The player can easily control the avatar in a long shot, but it is hard to control in an extremely long shot (from seventh to last frames). In frame 9 an object gets in the way and obscures the view.

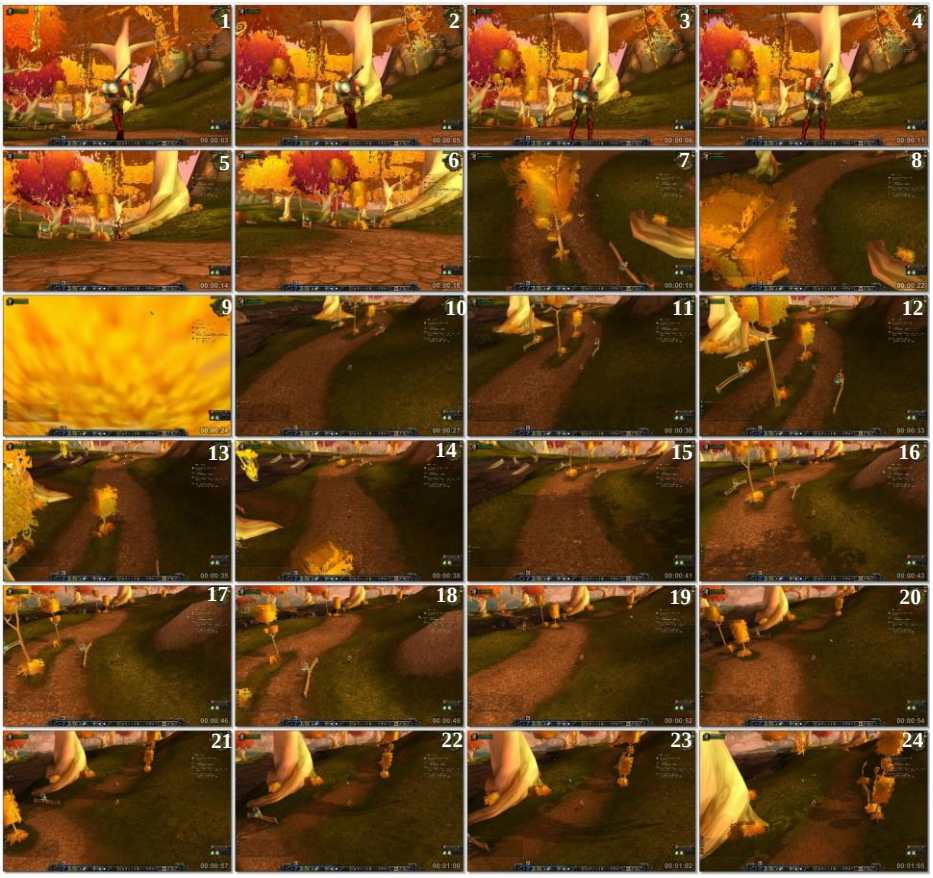

Plate 5-5 Third Person Perspective in WoW

5.2.3.5.3 Comparison of Visual Experience Between First- and Third-Person Perspectives

Plate 5-6 of the gameplay '[World of Warcraft: The Scorched Grove]' offers a comparison of first- and third-person perspectives through the author's own play. The screenshots in plate 6 are random video samples from a total of nine minutes

and nine seconds of gameplay; 24 frames were chosen out of 16,470. The game story starts with the player being invited to join a celebratory party in Eversong Woods. It is a chain quest, the player having received the invitation during the previous quest. The invitation requests that the player 'go to meet Laria Riverwind, who is on the Blood Elf staff, at Evensong Woods. The author recorded his experiences:

> I am among a Blood Elf community at a party called 'The Party Never Ends' at Eversong Woods; the Blood Elfs are laughing, dancing and setting fireworks off and celebrating; I am here because I received an invitation during my previous quest. During the party, I collect food such as Springpaw Appetiser and Bloodthirst Petal and drinks like Suntouched Special Reserve as an energy supply for the forthcoming quest. I chose third-person perspective to pick up food and drinks from the table around the stage for precision and because it made the avatar easy to control. When I had enough provisions I navigated by the map to the Goldenbough Pass tower to meet Laria Riverwind. On my way I switched to first-person perspective. When I got there, Laria gave me my new quest. The quest required me to slay ten Withered Green Keepers (deadly tree monsters) in the Sacred Grove Land. Scorched Grove Land looked dead. Trees and grass were dead; they had been burnt; it had been burnt to prevent Scourge's expansion expanding his territory. I tried to find a ways to kill the monsters but was afraid that I might that I would encounter many monsters at the same time. I decided to fight and ran into their land without running into any monsters. Suddenly, I encountered an ugly one with bright pink eyes but I could not see its whole; I could see only the upper part f its body. To see it clearly and to help me work out how to fight it, I changed to third-person perspective. After killing that monster, I had to kill more monsters to reach the target of ten.

Generally, when first-person perspective is chosen, it helps the player to receive the game world directly and gives a sense of immersion, like viewing through a camera. Looking at the video strip in plate 5-1, first-person perspective had been chosen in only one third of the frames (eight out of twenty-four). The main reason for this low proportion is the limitation if "lens" focal length; players cannot adjust to seeing things in the way that they can with real eyes. It is hard for players to work out the distance between them and objects. The "camera" does not allow players to estimate distances as they can, with their eyes, in the real world. The depth dimension cannot be sensed in the way that it can in the real world in which people can use prior experience to estimate distance. Third-person perspective compensates for this to some extent. Some players prefer third-person perspective because they can see the whole environment from a wide perspective and control their avatar's movement accordingly. Players using third-person perspective and can estimate distances between their avatars and objects, albeit imprecisely. Prediction and precision are important factors for players when interacting with objects.

Third-person perspective gives the player a sense of power by controlling an avatar from a high viewpoint. Most players choose third-person perspective to play World of Warcraft; on the other hand, first-person perspective gives a greater sense of immersion in the game world. Laurel (1993) argues that with first-person perspective, we experience feelings for and feelings with the characters. In first-person perspective players interact directly with game characters from their own viewpoint rather than the camera viewpoint; thus, first-person perspective gives a higher feeling of immersion in the game than third-person. Interaction is more personal in first-person perspective; for example, when running or attacking the "camera" shakes similar fashion to real life experiences; in this sense, the eyes perceive and interact directly with the game. A contrary argument is that with third-person perspective, the player is represented by a character embedded in the game world; players have a heightened awareness of other players; conversely, in first-person perspective, players interact directly with other players and not through an intermediary and have the opportunity to gain experience inside the game (Taylor 2002).

Perspective is the visual operator which regulates frame of reference; the frame is controlled through the adjustment of "camera" properties. Players can choose from first- or third-person perspective each of which creates feelings of immersion and authority in different ways. The five visual operators – Balance, Emphasis, Movement or Rhythm, Dynamics and Perspective – work together. The visual operators help the designer to organize visual elements to create game objects and the game environment. To use the visual operators effectively designers require principles to compose visual objects on the Game Content plane.

5.2.4 The Content Plane and the Expression Plane in the Visual Grammar of Three-Dimensional Online Games

The Content Plane and Expression Plane were described in the first section of this chapter; the two Planes constitute the Visual Grammar of Three-Dimensional online games. The Content Plane is constructed of Visual Elements regulated by visual operators. Visual operators work on the Expression Plane. Visual elements require more than visual operators; they require rules or 'principles' to systemise or compose them in the vast visual landscape. In this study, they are called 'Visual Rules'; they are based on Saint-Martin's 'Rules of Visual Syntax' and gestalt theory. Saint-Martin's Basic Plane and Virtual Cube are useful for discussing game objects. An object can be two- or three-dimensional and located in the huge three-dimensional visual landscape with its territories which can be on tor under the ground, underwater or in space. A 'gamescape' is the landscape for one game and contains several territories which are linked in the visual design. Saint-Martin's Environment Cube frames the visual grammar of the whole gamescape or a territory. For Saint-Martin, the basic elements of the basic plane are coloremes: clusters or groups of visual elements. Coloremes group and regroup themselves according the rules of visual grammar; the rules are topological relations, gestaltian relations and the laws of the interaction of colours. The failing of these rules in this

Plate 5-6 Compared the first person perspective and third person perspective

research is that they ignore audiences; audiences are assumed to be passive consumers; later, though, he did include audiences in his analytical framework. Games must have players and players' activities and relationships with visual objects are interrelated and guide players' actions; game and player interactions will, therefore, be an integral part of the visual rules.

5.2.5 Visual Rules; the Rules of Visual Syntax

The visual landscape of games is a complex construction of visual elements formed by visual operators. The foundations of the visual landscape are multidisciplinary, ranging from painting to interactive media. The rules of Visual Syntax for digital games need to be broadly based, based on game genre and encompassing players and their interactions. Visual operators, which designers use to compose and regulate objects in the virtual world, require Visual Rules. Visual Rules organize and control the Content Plane from small objects to the entire gamescape. There are five Visual Rules. The examples of gameplay produced for this research will be used to frame the Visual Rules. The Visual rules of digital games are drawn from:

- the **Basic Plane**
- **Gestalt Theory**
- **Visual Design**
- **Game Mechanics**
- **Interaction**

There are five **Visual Rules**, each containing its own set of laws:

Rule 1: The Basic Laws of Visual Perception

The Principle of Simplicity – ***People are able to recognise and understand patterns constructed from simple shapes and forms.*** Complex structures are hard to describe and remember. In the World of War gamescape, some territories are hard for players to interpret; some players become confused and get lost in the game. Some visual elements and objects must be visually differentiated so that players can easily recognise them, for example the monster's shape in **figure 5-18** and the boss (Anok'suten) in the gameplay 'Suncrow Village'.

Figure-Ground Perception – ***Foreground and background are differentiated visually onscreen.*** In art theory, foreground and background are known as 'figure' and 'ground' respectively or 'positive space' and 'negative space'. 'Positive space' is the area dominant area of focus for the viewer. 'Negative space' is the remaining area which attracts the viewer's attention after 'positive space'. To avoid confusion, the term 'figure-ground' will be employed in this research. The principle is often invoked in the design of objects, for example in the stylish lines in figure 5-11 which stand out as figures against the ground; the lines contrast with the orange ground.

Differentiation – ***Until a visual feature becomes differentiated, the total range of its possibilities will be represented by the structurally simplest among them*** (Arnheim 1974:181)**.** Objects, in other words, are classified by the viewer according to the simplest of their features and not initially differentiated individually. The importance of this Visual Rule lies in its application to groupings or 'coloremes' (Saint-Martin 1987). The principle can be used to classify objects for grouping and regrouping, marking the dominant object, and in collaboration with the Principle of Simplicity. Arnheim used the terms 'marked' and 'unmarked'. 'Unmarked' refers to a neutral or general shape – the object is not dominant; for example, a circle is an unmarked shape compared with a rectangle or triangle. 'Marked' refers to shapes which stand out; for example the blue light in figure 5-11 is at odds with its surroundings due to difference of shape and colour. The Principle of Differentiation can be applied to both micro design including armour and avae tars – the visual design of small objects – and macro design – the visual design of the gamescape including buildings, forests and towns. The Law of Differentiation is also applied to sound design, to, for example, avatar language, animal sounds and sound effects.

Continuity – ***Placement of objects creates the illusion of lines or patterns.*** Even if there is a gap in a line, the mind will fill it in to establish the illusion of continuity. The Principle of Continuity is used to align visual objects to lead players' eyes in a particular direction. Visual continuity is often used to establish continuity in a quest. Continuity can, likewise, be used to differentiate territories. It can also be used to associate visual elements such as size, colour, texture, etc.

Gestalt – ***An organised whole is worth more than the sum of its parts.*** In game design, Gestalt theory is applied to create balance, emphasizing the importance of both micro and macro design of props and territories as a whole, not independently. Individual objects are designed and positioned as part of a whole system.

Individual Experience – ***All players bring experience to games and acquire experience during games***. Designers must take into account players' experience; for example, everyone knows what a house or tree is. If the designer introduces an object which is unrecognizable in the real world, or has functions different from in the real world, an explanation must be given to players; it might be text, sound or animation; players must remember this information in preparation for the next encounter. Individual experience is included in the Laws of Visual Perception to combine with other rules.

Rule 2: The Laws of Visual Grouping

Visual Grouping is a fundamental concept of Saint-Martin; it regulates coloremes in the Basic Plane. Objects are visually systematized into groups. Groups are formed from objects which share visual elements and properties.

Figure 5-22, created using three-dimensional software, illustrates the grouping laws. Using figure 5-22, the author performed a visual reading test with colleagues from Africa, Asia, South America and Europe who were asked to group the objects through criteria of similar shape, size, colour, position, proximity and closure. Most participants started with the pink pyramids and worked their way through the green spheres, blue pyramids to the green cubes; they not only grouped the objects by colour and shape but also clockwise along the curved line which joins the groups. The organization of the objects creates the illusion of motion and provides direction for reading them. Although most colleagues gave identical responses, there were exceptions. Most started by grouping shapes, but one colleague was attracted by the bright pink of the pyramids; others could not explain why they started with the pink pyramids. Most used criteria of shape and colour to group the objects. These criteria can be formulated as visual rules. The grouping rules can be applied to both micro and macro designs. There are two further criteria which viewers use to group objects: common region and connectedness. To perform visual investigations, we can conclude that there are seven criteria for grouping objects visually:

- Proximity – Objects will be seen as a group when they are positioned close together.
- Similarity – Objects will be perceived as being a group if they look similar.
- Symmetry – At the centre of interest, the mind will perceive objects as forming symmetry.
- Closure – Objects are organised into recognizable patterns which viewers perceive as a whole even when they are incomplete.
- Continuity – Visual elements are perceptually grouped together as a whole when they are aligned in the same direction.
- Common Region – Alignment of objects creates the illusion of movement along lines; this combines with the Law of Continuity to create the illusion of motion.
- Connectedness – If objects are connected by visual elements such as line, dot, etc., they will be perceived a single object.

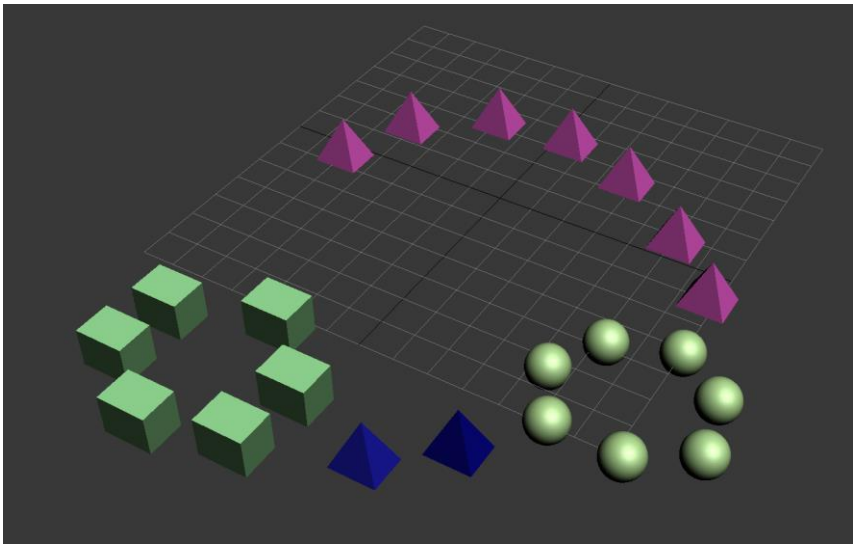

Figure 5-22 The laws of grouping

The Laws of Visual Grouping are also known as the Gestalt or Laws of Visual Perception meaning that they describe an 'organized whole' (Desolneux 2008; Metzger 2006; Rock & Palmer 1990 and Petermann 1932).

Rule 3: Composition Principles

To construct a game, designers need to integrate all visual elements and operators and other components of the game including storyline and gameplay. Composition

Principles can be applied to the construction of a gamescape. A gamescape is a complex construction of visual objects; visual objects, in their turn, are constructions of visual elements. Wassily Kandinsky (1866-1944), a Russian artist and art theorist, contributed to the study of composition with his book 'Concerning the Spiritual in Art'. For Kandinsky, forms are a means to express content. Kandinsky (1911) takes the idea further. For him, a painting is not composed of a primitive complexity of visual elements (points, colours, etc.) from the visual world; it is, rather, constructed from the tensions of elements on a purely spiritual basis; he called this concept 'Picture Plane'. Henry (2009), who was inspired by Kandinsky's idea, calls this 'spiritual composition' 'a hidden composition'. Henry noted that '… since every form is composed of parts, the variation of one part reverberates on the tone of the whole. It is thus possible to act on the whole through very small changes (2009:98).' Henry divides composition into simple and complex. Simple composition is the dominant form: clear and simple. Complex composition combines dominant forms creating a subtle network of similarities and differences. Henry states that '… this complexity gives the spectator the enjoyment of carrying out an endless quest (2009:99).' Application of these ideas can be applied to investigate small details to discover the hidden composition of the game. The principle of composition in the game is based on Kandinsky's 'Picture Plane'; he had developed his concept from paintings. Kandinsky talked about Similarities and Differences; we can usefully add Repetition to the Composition Principles:

- Repetition
- Similarities
- Differences

Composition Principles combine with Visual Elements, Visual Operators and the other laws of Visual Rules to construct the complexity of the gamescape which Saint-Martin calls the 'Environmental Cube'. The Principle of Simplicity, already discussed under Law 1 can be applied to examine similarities in objects such as colour, brightness, speed and direction (Arnheim 1794:88). The Principle of Composition integrates with the first two sets of laws concerning visual perception and grouping.

Rule 4: The Principle of Visual Interactions

World of Warcraft is an interaction between players and the game; the interaction is gameplay. Visual organization is regulated through visual composition in conjunction with interaction. In this section, we shall concentrate on interaction between player and object to compose visual rules. From previous gameplay analysis, interaction can be classified into three types;

1. Random Interaction takes place when players have authority to interact with any object, usually by trial and error when players are uncertain about their next action.

2. Selective Interaction occurs when a player deliberately interacts with an object. (Randomness may occur even in deliberate play, for example if most choices of object to interact with are strategically eliminated reducing final random choices of objects to interact with to a small number; this is still classed as Selective Interaction on the grounds of players' intentions.)
3. In Responsive Interaction, players respond to stimuli planted in objects through the game mechanics. Responsive interaction can be divided into:
   (i) Single Interaction is one response to a clue set up in the game mechanics, preceded and followed by Random Interaction
   (ii) Sequential Interaction occurs when players follow a chain quest or multi-quest (to be explained in chapter 6): a series of actions depending on correct responses to clues set up in the game mechanics.

The three types of interaction are the reason why games differ from other media. Interaction is one of the factors which keep players playing and returning for more. Through interaction, the player is co-writer of the game story. Interaction is necessary for continuity; a game and the story will stop if the player stops interacting. Interaction, gameplay and gamescape must be balanced to ensure progression. The existence, appearance and disappearance of symbols and objects in the visual field are interrelated with interaction and organization.

Rule 5: Interactivity and Game Mechanics

Interaction is part of game practice; interaction takes place in the real world and between the real and virtual worlds; in other words, as Bjork & Holopainen (2005) put it: '… we define gameplay simply as the structures of player interaction with the game systems and with the other players in the game.' For Rollings (2004), gameplay is a subset of interactivity. King and Krzywinska (2006) consider that gameplay provides different experiences for players. Salen and Zimmerman (2003:60) define 'interactive', 'interaction' and 'interactivity' thus (with additions from dictionary.com):

> ***Interaction****: 1. intermediate action 2. Mutual or reciprocal action or influence;*
> ***Interact****: to act on each other; act reciprocally.*
> ***Interactive****: reciprocally active; acting upon or influencing each other; allowing a two-way flow of information between a device and a user, responding to the user's input*
> ***Interactivity****: an interactive relationship between two things*

Salen and Zimmerman propose four models of interactivity:

> Mode 1 – Cognative Interactivity: interaction between player and game system such as sequential visual interaction between players and game objects.

Mode 2 – Functional Interactivity: interaction between player and game from both real world and virtual world such as the visual interface of the game
Mode 3 – Explicit Interactivity: choices and procedures programmed into the game to give a sense of real life in the virtual world such as changing the clothing of your avatar.
Mode 4 – Beyond-the-Object Interactivity: interaction outside the game through fan culture

Modes 1, 2 and 3 describe interaction between player and game components, such as objects, which gives the player a meaningful experience. Interactivity encourages players to continue playing; gameplay, however is systemized and controlled by the 'game mechanics.' Players' decisions or choices during gameplay can unbalance the game; the game mechanics, through unseen programming will reorganise and rebalance the whole game. Players make choices for various reasons: psychological, perception, group decisions, cause and effect, trial and error, past experience, etc. but their choice will determine subsequent scenarios, events, sequences and imagery. Game mechanics does not directly control visual elements but does control gameplay sequences which contain their own imagery. Each game has its own mechanics such as attack and defence, shooting, flying, diving, throwing, blocking dodging, action points, auctions and captures. Interactivity combines visual rules and operators.

All five rules operate simultaneously in conjunction with the visual operators through the Modes of Interactivity and visual construction and representation. Rules 1, 2 and 3 control visual composition and regulate objects. Rules 4 and 5 control play and action including timing of interaction, type of game territory and number of players; for example, if the territory is underwater or in space, interaction may be slower than on the ground or underground.

5.2.6 Application of Visual Grammar to Gameplay Analysis

To establish a framework of visual grammar, we constructed the following components: visual elements, visual principles, visual operators and visual syntax. Our Visual analyses focused mainly on basic design features such as the "zoom lens." In this section, we will investigate the game holistically including story, interaction and visual design. All principles and rules will be applied to gameplay analysis. Previous investigations focused on how the visual elements, visual operators and visual rules work in the visual design of WoW. This examination shows us that how these components and their features play roles in the visual design and construction of visual grammar in WoW. However, in earlier analyses player interaction was considered incidentally. The following investigation will take visual analysis to its next level; the investigation concentrates on gameplay, quests and visual interaction. In this analysis, visual elements and other components which have already been examined will be discussed only where they impinge directly on the new topics. Some parts of visual analysis, however, will be integrated into examination of gameplay.

5.2.6.1 Gameplay Analysis – Example 1: A Low-Level Quest

The initial quest for a new player is described as a 'Low-Level Quest '. Consider the previous gameplay, 'The Scorched Grove', illustrated in figure 6**,** and which takes place in Eversong Woods in Blood Elf territory. The aim of the quest is to find Larianna Riverwind near Scorched Grove to the south-west of Eversong Woods. The video of the gameplay starts with the events of 'The Party Never Ends' and finishes with a quest called 'A Somber Task'. The video can be found in this link: WoW: The Scorched Grove. The quest details are as follows:

The First Quest

(a) Quest Name – The Scorched Grove
(b) Quest Objective – To find Larianna Riverwind (sister of the NPC who gives the quest to the player) near The Scorched Grove, south-east of Eversong Woods
(c) Quest Description – Soil contamination precedes the Scourge's expansion into a new territory. Protective runestones along the border with Ghostlands have protected the land against contamination in the past. The westernmost runestone was destroyed in a Scourge attack; the ground had to be burnt to prevent the contamination from spearding. Larianna Riverwind is in The Scorched Grove. Find her! She might have further tasks for you.
(d) Location – Eversong Woods
(e) Rewards – You will receive 85 Coppers
(f) Gains – 231 Expereinces

The Second Quest

(a) Quest Name – A Somber Task
(b) Quest Objective – To slay ten Withered Green Keepers at The Scorched Grove and report back to Larianna Riverwind at the tower just north-west of The Scorched Grove in eversong Woods.
(c) Quest Description – Scourge's expansion had been stopped by the burning of the woods which had been a hard decision. The Truants (friendly monsters) are trying to foster the regrowth of the forest along The Scorched Grove. The Quest will be hard because our former allies are still fighting us. You must stop them by the only means left to us: force!
(d) Location – Eversong Woods
(e) Rewards – You will receive 3 Silvers
(f) Gains – 852 Expereinces

Gameplay Analysis

The visual grammar framework will be applied to the game story, visual interaction and visual analysis.

(a)Illustration of the Game Story from the Gameplay

The story starts with the player (avatar) collecting food and drink from the table on the party stage. The player searches for the way to the target of the quest. He chooses a shortcut using the navigation map. He chooses to run away from the Springpaw Appetizer (sabre-tooth tiger) and other monsters until he finds the correct route to Larianna; he meets her. The player returns the quest and accepts a new one, the Sombre Task, to slay ten Green Keepers at The Scorched Grove. The player leaves the tower and departs to kill the monsters one by one. The gameplay can be divided into four episodes:

(a) Collecting food and drink at the Party Never Ends.
(b) The journey to meet Larianna at the tower.
(c) Meeting Larianna and sending the quest to complete it and receiving a new quest.
(d) Killing ten monsters at The Scorched Grove

The four episodes are illustrated in the diagram (figure 5-23).

The diagram of gameplay story

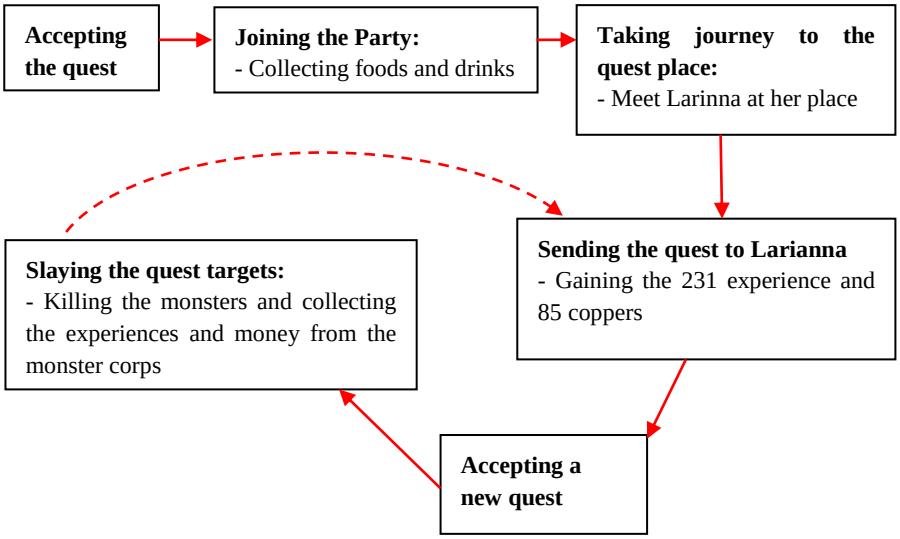

Figure 5-23 The diagram of gameplay story

(b)Visual Interaction Analysis

The four events of the gameplay can be classified according to the three types of interaction: Random Interaction; Selective Interaction; and Responsive Interaction.

Random Interaction

- Picking up food and drink which is on offer on the main table at the party
- Searching for the right direction to the target; finding the correct target (Green Keepers) by placing the pointer symbol on them at long distance to check (the symbol will change from a hand to a knife if the object is an opponent).

Selective Interaction

- Opening the navigation map; finding out the right direction to the target from the symbol on the map; move away from opponents (Withered Green Keepers).
- Choosing to run and jump away from the Springpaw Appetizer (sabre-tooth tiger); attack without self-defence.
- Selecting an alternative route to the target rather than the main road in order to avoid confronting the Springpaw Appetizer or being attacked by Wretched Blood Elfs.
- Choosing third-person perspective at a high angle to get a better view of the route for the journey.
- Choosing first-person perspective to observe scenic game territory when the feels safe.
- Placing the avatar as centre of interest at the bottom centre of the screen.
- Choosing third-person perspective to fight the Withered Green Keepers in order to judge distances more accurately, especially for aiming weapons
- Selecting a safe place to fight where the opponent is isolated

Responsive Interaction

- Trying to move away from Springpaw Appetizer and Wretched Blood Elf territories because the player has no experience in fighting them.
- Adjusting direction to target to avaoid mointains or long distances.
- Collecting trophies from dead monsters.
- Taking time to observe and evaluate visual landscape at opponent's location.

Problems with Visual Interaction:

- Measuring distances in first-person perspective: the game does not provide any means of measuring distances from player to target in firt-person perspective.
- Using first-person perspective for fighting is inappropriate because of limited vision.

(c) Visual Element Analysis

Visual objects can be divided into mobile and stationary objects. Mobile objects move unaided (because they have been programmed to do so); they may be alive (within the game) such as avatars, NPCs, animals, monsters and machines such as robots. Stationary objects can be trees, buildings, stones, grass, etc.

Mobile and Stationary Visual Objects can be also classified according to two main design categories: those with a micro visual design and those with a macro visual design:

Macro Visual Design relates to stationary and mobile objects especially game territories and gamescapes such as the party stage, Eversong Woods, fields, main roads, Sunsail Anchorage tower, Larianna's tower, Scorched Grove, the green island, sky and forest.

Micro Visual Design refers to stationary and mobile objects. It includes:

(a) *Mobile Objects* such as the avatar, a group of Night Elfs (NPCs) at the party, the magic bookshelf, Springpaw Appatizer (sabre-tooth tiger), Golden Dragonhawk Hatchling (a player's companion), and Witherered Greenkeepers.
(b) *Stationary Objects* such as food and drink, tables, wooden sofas, books, clothes, swords, icons of game objects in the backpacks, the navigation map, the fence with its lamps, the hand pointer, Bloodthistle Petal (a flower in Eversong Woods), weapons, boxes, beer tanks, flasks, the quest bar and lighting effects from fighting.

Visual environments and objects are created from primary and secondary visual elements; we see them as three-dimensional textured objects. The gameplay takes place in Night Elf territory which is full of bright forest and decorative buildings; the territory connects with the sea and other territories overland and via a bridge. The design is colour-themed to separate territories and sub-territories. Colours indicate danger and safety; for example, Scorched Grove is black, representing danger. Colour themes apply at both Micro and Macro Visual Designs; the Withered Green Keepers are a textured dark grey differing from the light green of the same kind of monster in other areas. The red name labels and the big pink fire-eyes warn of opponents. Hue, tint, shade and value are integral to colour themes and are applied according to the gestalt principle to highlight difference and similarity.

Another application colour theming is found in Eversong Woods; warm colours – bright red, pink and yellow (primary and secondary) in the trees, buildings, Blood Elfs' skin and clothes represent the magical capital city of the high-class Blood Elfs. It is always daytime and the sun always shines in Blood Elf territory; it never night. Play continues with no indication of time in Blood Elf territory. Most visual elements and objects are organised to balance the composition; designers also strive to balance the continuity of the game by providing visual guidance, and sometimes impassible barriers, to ensure that players proceed in the right direction.

A player may take on the role of designer by making his or her avatar the centre of interest by placing it at the bottom centre of the screen with a slightly high-angled viewpoint. Players draw on previous experience during the game; they will try to escape the dangerous Springpaw Appetizer and the Wretched Elfs (Blood Elfs which fail to control their addiction to magic).

Interface Design

The Interface is the point of interaction between player and content. Player communicate with the game through hardware such as mouse, keyboard and joystick and onscreen menus, backpacks and so on; in response, they get feedback onscreen and in sound. For players, the primary interfaces during the game are:

> The Experience Bar is located at the bottom of the screen; it encompasses the Action Bar, Interface Panel, Latency Bar, Bag Slots and Backpack. The Experience Bar indicates the status and skill-level of the avatar. Players interpret the meanings of signs or Icon Symbologies (Sander et al, 2007); the signs show an avatar's profile and status, its equipment and skills. Players manage their own properties via the Experience Bar by collecting objects, buying objects from, selling objects to and sharing objects with NPCs and other players.
>
> The Character Portrait consists of the avatar's name and portrait; and the Power Bar which indicates the avatar's health and, by extension, its fighting ability. The Power Bar is a tube containing a green line. It indicates how much life remains to the avatar; it can increase as well as decrease.
>
> The Minimap is a zoomable plan of the area around the character.

Other interfaces are located on the left- and right-hand sides of the screen. They are the Chat Menu containing chat and combat logs and the Game Quest bar.

Sound Design

There are two types of sound in a digital game:

> Diegetic Adaptive sound is background music and ambient sounds. Sound may indicate, for example, a new location.
>
> Diegetic Interactive sound derives from avatars' and NPCs' actions. Examples are the sound for picking an item up; running on grass, on a road or in a building; the sounds for opening an interface or the map or accepting a quest; the noise of fighting; looted items which have their own sound and looted money which has a different sound from other items; or the sound of a sword swinging round.

5.2.6.2 Gameplay Analysis – Example 2: A High-Level Quest

(a) Quest Name – A Spirit Guide

(b) Quest Objective – To use the Wolf Totem at the location where you found Krun Spinebreaker's body and to follow the Ancestral Spirit Wolf.
(c) Quest Description – Even the best tracking wolves' senses can fail them. The spirits see things differently from us. The creature you call up will lead you to the person you are looking for, where you found the stone axe, drawn by his essence, not his scent.
(d) Location – Hellfire Peninsula
(e) Rewards –
(f) Gains – 11,055 Expereinces

The gameplay videolink is WoW: A Spirit Guide

Gameplay Analysis

(a)Illustration of the Game Story from the Gameplay

The gameplay begins (in the first shot of plate 5-7) with the player flying his Blue Wind Rider to Hellfire Peninsula, a dry land with high mountains. The player searches for the quest target marked by a symbol on the minimap. The avatar arrives at the right locationbut cannot find the target. The player tries to use the quest totem with the NPCs but the location shown on the map is incorrect. The player then investigates every building in and just outside Mag'har post, the game territory. He flies above neighbouring territories using the minimap without success. He flies outside the territory again and discovers a corpse, called Sedai, but Sedai is not the target. He continues to search other areas until he finds the target, Krun Spinebreaker's body (shot 15). The player uses the totem to call an ancestral spirit wolf; when the spirit wolf comes. When the wolf spirit arrives he mounts his Blue Wind Rider and follows the spirit; it is safer than running on the ground. From his previous experience, he knows that he would have to pass opponents such as the giant Hulking Hellboar (giant pig) and the giant Robot so it is fortunate that he is flying. The wolf spirit leads him back to Mag'har Post from where he sends the quest to Gorhak Bloodfist (NPC) to gain rewards. The player's main activities are *searching*, *trial* and *error* and *planning*.

(b)Visual Interaction Analysis

We can identify three main categories of interaction:

Random Interaction
- Activating the quest item with the target.
- Searching for the correct quest target by tracking the symbol on the minimap.

Selective Interaction
- Opening the minimap; determining the course to the target which is marked by a symbol on the minimap, whilst avoiding opponents such as the giant Hulking Helboar (wild pig) and the giant Robot.

- Initiating a search from the air and on the ground both in and outside the territory.
- After discovering Krun Spinebreaker's body, switching to flying to track the spirit wolf.
- Setting the avatar's direction towards the right target.
- Placing the avatar in the centre of the screen to be the centre of interest even when flying.
- Observing other fights rather than joining in.

Responsive Interaction

- Flying to follow the wolf spirit.
- *Considering a new quest before accepting it.*
- Flying to follow the wolf spirit.

Plate 5-7 The video-strip of the gameplay: the quest 'A Spirit Guide'.

(c) Visual Element Analysis

The quest takes place in Mag'har territory on the Hellfire Peninsula. The Hellfire Peninsula is to be found on a continent called Outland floating in space. Outland is all that remains of an historic battle on a planet called 'the red world Draenor'; its history is relevant to the game but not to investigation of the visual elements of gameplay.

Macro Visual Design relates mostly to the game sets and gamescape. It consists of mountains, the sky and the Orcs post.

Micro Visual Design relates to the objects including props, the avatar, NPCs and weapons.

The gamescape design is unbalanced due to the use of a single colour – red – which represents a history of battles in the territory in which the land was burnt and contaminated. To produce an unbalanced landscape, the designers also applied a texture to make the ground look dry and fragmented. There are neither living things – no trees, insects nor animals - nor a river, apart from the opposing creatures. The sky is dark and there is little light. The game does provide the player with a way of flying to balance the game since the land is bounded by high mountains that players cannot walk across. Players must have a skill level of at least 60 to travel this world which means that they can fly and have a licence. The composition of all visual elements emphasizes the theme of 'Hellfire' through colour, coarse texture, light and the pattern of the mountains. Visually, the gamescape dominates the game.

The gamescape lacks visual dynamics because of low lighting and absence of shadow exacerbated by a single colour and repetitive texture creating a feeling that everything is stationary. The designers' objective was to portray a dead land.

The analyses of the two quests in contrasting gamescapes show how Visual Grammar affects players and interaction. Figure 5-24 illustrates how Visual Rules interact with the game world directly and simultaneously indirectly via Visual Elements and Operators. Visual design of digital games is a combination of both Micro and Macro with Micro Visual Design elements combining to create the Macro Visual Design; Macro Visual Design can also be created directly. The game allows player to create and adjust some aspects of visual design themselves. Players can, for example, create their own weapons; make changes to their interface design, etc. Players can connect with the game through visual design and interaction. Players can extract meanings from the Visual Design which is organised in accordance with the game story.

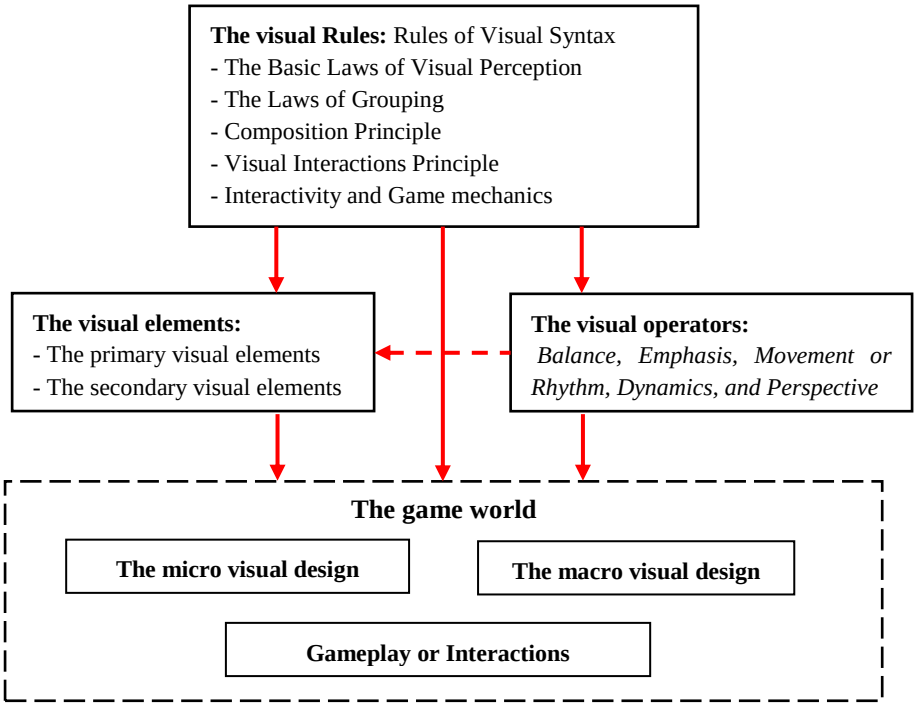

Figure 5-24 The diagram of visual grammar and game interaction

5.3 Establishing a Visual Grammar

We shall establish the structure of Visual Grammar for three-dimensional online games by defining the initial visual units such as visual elements. Subsequently, we shall frame the visual operators which regulate the visual elements governed by the visual syntactic rules. Visual grammar includes not only interaction of visual objects; the site of the player, who interprets the visual aesthetics and gains experience, must also be taken into account. The frame of the concept for Visual Grammar is illustrated in figure 5-25.

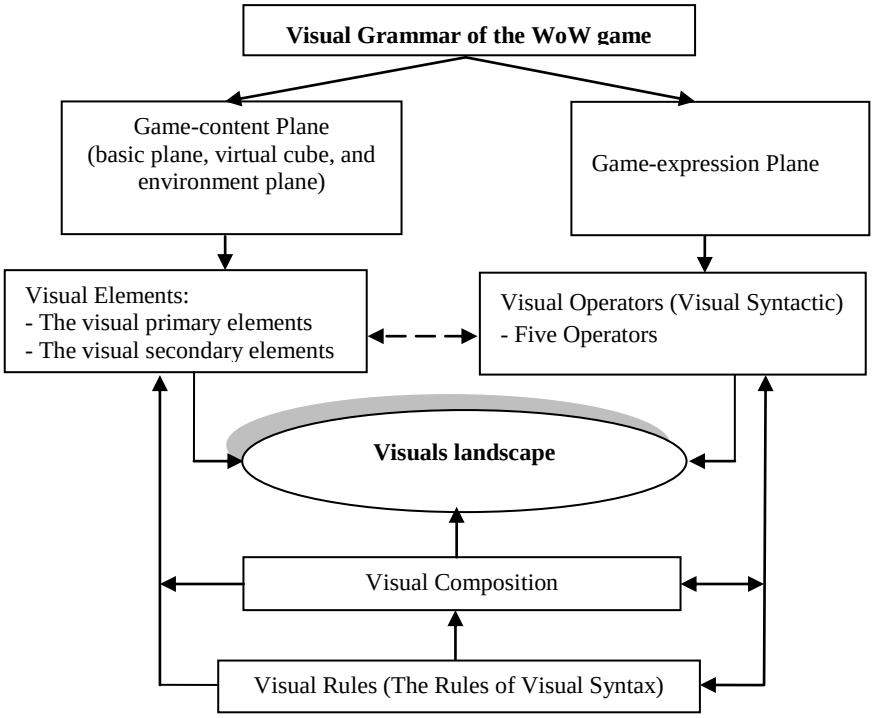

Figure 5-25 The visual grammar framework of the three-dimensional online game, WoW.

Visual Composition is the critical factor in regulating, systematizing and balancing the visual environment. It works interdependent ways: Micro Visual Design and Macro Visual Design. When using Micro Visual Design, designers employ the visual operators and syntactic rules to create objects such as an avatar's armour or clothes. The shape, form texture, colour and balance are designed to comply with the rules of visual composition. Designers can create a new pattern to represent texture of clothes through line and colour; they can imitate natural patterns such as rocks. Objects are created individually by teams of designers. Creation of objects requires visual elements and operators; we can call it the initial 'composition', for which we shall use a lower-case 'c'.

After creation, objects need organizing and arranging according to the Composition Principle for Macro Visual Design. Macro Visual Design encompasses any design on a large scale such as an island, building or cave. Designers combine all visual operators and rules for Macro Visual Design. We shall call this 'Composition' with an upper-case 'C'.

5.3.1 Visual Language of the Game and the Theoretical Framework for Visual Grammar in World of Warcraft

For Visual Analysis of objects in World of Warcraft, the main theoretical frameworks will be art theory, visual semiotics, and multimodal discourse analysis. Through the site of the game, we can address the terms of analysis: visual elements, visual operators, experience, interaction, visual interpretation and meaning. Analysis of the author's own gameplay and from the gameplay workshop focused mainly on four aspects:

(a) Visual Objects – Some objects simulate things from the real world; others may be imaginary and exist only in the virtual world. Objects represent and signify meaning; players make sense of them through their gameplay through sight, sound and feelings or emotion. Examples of objects are avatars, equipment, trees, rocks and lightning.
(b) Player Activities - Player activities encompass everything the player does in respect of the game including interaction with the virtual world and within the real world.
(c) Interpretation – Interpretation refers to meanings which derive from visual objects, gamescapes and interaction.
(d) Experience – Experience concerns emotions and learning which derive from interaction and is cumulative. Experience enables players to immerse themselves in the game.

Gameplay analysis demonstrates that interaction and experience are components of visual language; this will be discussed further in chapter 6. Additional components of visual language will be employed for the analyses.

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CHAPTER 6. PLAYER PERSPECTIVES IN THREE-DIMENSIONAL ONLINE GAMES

A framework for visual grammar concentrating on Visual Elements, Visual Syntactic Rules and Visual Operators was proposed in the previous chapter. Visual Grammar is used to analyse visual objects and gamescapes in World of Warcraft in order to establish the visual language of the game. Visual grammar, in chapter 5, largely ignored the role of player experience. Although player experience is not strictly part of the study of either Visual Semiotics or Gestalt Theory, it was mentioned; this is a limitation of Visual Semiotics and Gestalt Theory. This chapter will deal with player experience and how it can be incorporated into Visual Grammar.

Visual Grammar describes the basic principles of Visual Composition in online digital games: how visual objects are constructed; and the rules that govern them in the gamescape. Visual Analysis requires Visual Grammar and Syntax.

Player experience is an important component of Visual Language (see the chapter 5). Experience is an accumulation of experiences; **experiences include reactions and responses**. It is a component of the Visual Rules which regulate the Visual Elements. A framework is necessary to analyse player experience. Gameplay is interaction between player and the virtual world and between players. No single theory or analytical technique can be satisfactorily applied to player experience; a workable amalgam of theories and techniques needs to be developed. Some scholars have developed particular analytical frameworks to suit their own requirements; they tend to focus on specific modes such as game mechanics, players or sound at the expense of the multimodal. Analytical frameworks for a single mode cannot address interconnections and interaction which are important in this research; however, they are of value in this analysis; therefore, I am developing an analytical methodology based on existing theories. This chapter employs two main theoretical practices for investigation. They are (a) Multimodal Discourse Analysis of player reactions and (b) Social Semiotics (discussed in the chapter 4). The initial development of the analytical methodology started by adopting Halliday‘s framework to analyse modes of gameplay, and was later applied to multimodal interaction (Norris 2004) to classify complex interactions of WoW by using practice-based methodology (i.e. based on integrating existing theories with the results of my own analysis) (see Figure 6-1).

6.1 Constructing Analytical Methodology from Theories

To develop analytical methodology, existing frameworks were first considered. Some terminology causes problems because different researchers may use one term in different ways with different meanings and some use different terms for the same or similar meaning. One example, discussed by Scollon and Levine (2004:2), and relevant to this research, is 'mode', 'modal' or 'modality'. They make the point that

mode	**a kind of communication**
modality	any of the many ways in which a semiotic system with an internal grammaticality, such as speech, color, taste, or the design of images, may be developed
multimodal	refers to integration of modes and modalities in the context of this research

these words can refer to modal verbs and may be extended to other related grammatical meanings. They continue by considering modes of communication: in Theo van Leeuwen's thinking, "modality", in the traditional grammatical sense, is different from modes of communication: any of the many ways in which a semiotic system with an internal grammaticality, such as speech, color, taste, or the design of images, may be developed; the different meanings of *mode* and its derivatives must not be confused. In this research, 'mode' refers exclusively to 'a kind of communication'. The three sites of modality employed in this research are the site of the game, the site of the player and the site of production; each contains many modes of communication. Interaction between the modes in different sites is one of the major concerns of this research. Each mode of communication requires its own analytical framework; there is no single extant framework which can be applied to all modes.

Developing the analytical methodology for this chapter, Social Semiotics and Multimodal Interaction are applied to investigate the interconnections between modes. These interconnections explain how players interpret meanings from different modes.

(I) Social Semiotics (Holliday's concept): the three components of Systematic Function Theory were adapted as follows for this study to define modes of the gameplay and player interaction.

- **Field of Game Discourse** – applied to gameplay activities in both real and virtual worlds.
- **Tenor of Game Discourse** – applied to profiles of the players such as gender, skill levels and so on, and to relationships between players and their roles.

- **Mode of Game Discourse** – applied to interaction between player and the game and between players including dialogue, gestures, movement; and symbolism such as the visual elements.

The three components can be applied to frame the analytical methodology of player experience in WoW through Dietic, Epithet and Thing (see chapter 4).

- The Dietic is used to identify modes of gameplay interaction and to classify and interpret their components.
- The Epithet indicates the quality of gameplay components.
- The Thing is used to interpret meanings of the gameplay components.

(These will be described in the following sections.)

Systemic Function Theory (Halliday 1978, 1994; Halliday & Hansan 1985; Halliday and Matthiessen 2004) defines a 'culture' as 'a set of semiotic systems or a set of systems of meaning in which language is one of a number of systems of meaning' (see chapter 4). Halliday notes that the study of sign systems, which includes art forms and other cultural behavior, is an aspect of the study of meaning. To adapt Halliday's systemic function theory to investigate player experience in World of Warcraft, the game is considered a set of systems of meaning in digital culture. Meaning in the game comprises the site of the game and interaction between game and player and interaction between players. The site of the game is a complex system of signs. Halliday developed the idea of 'the context of situation' to interpret the social context of a text; he defined 'context of situation' as the 'environment in which meanings are being exchanged'. His 'context of situation' comprises three elements: 'Field of Discourse', 'Tenor of Discourse' and 'Mode of Discourse' (see chapter 4 for Halliday's definitions). The semantic system of a language also has three components: ideational, interpersonal and textual (see chapter 4). Halliday's systemic functional theory – Halliady used the terms 'systemic function theory', 'systemic functional theory' and 'systemic functional grammar' interchangeably – is concerned primarily with traditional linguistics and is suitable for limited application to online digital games; for example, he uses cohesive chains to define related meanings of words (lexical units). He takes little account of interconnections with and interactions between other modes. A more advanced and practical framework is required for games incorporating sign systems from both the virtual and the real worlds. Halliday's framework is useful to classify modes of analysis.

'Concept of Situation' concerns social context; 'Field of Discourse' refers to social action; 'Tenor of Discourse' refers to participants and their relationships; and 'Mode of Discourse' to the language of situation. These components are adapted in this research to ensure suitability for study of digital games (adapting Halliday's concept will be explained during analytical steps).

In addition, to adapt the concepts of social semiotics to analyse modalities of player perception, we need to integrate social semiotics into Rose's sites and modalities (see the chapter 2). In her visual methodology, Rose (2001, 2007) divides the

meaning of visual material or a set of images into three sites: the Site of Audiencing; the Site of Production; and the Site of the Image. Each site consists of three modalities:

(a) **Technological Modality** is concerned with how media are made, transmitted, circulated and displayed and what their visual effects are; it focuses on how media are produced and how they are represented to the public.
(b) **Compositional Modality** refers to the nature of the media, genre, composition, viewing perceptions and relationships with texts; it is concerned with the arrangement of small components in order to classify the medium and its qualities and characteristics; it encompasses relationships with other media and its audiences.
(c) **Social Modality** looks at who produces media, who consumes them and when: or, the how and why of interpretation of visual meanings in the media.

Rose's work was discussed in chapters 2, 4 and 5. In this chapter, Rose's Social Modalities of the Sites of Audiencing and of the Image have been adapted to investigate audiences and interaction. The investigation focuses on player perception and practices: how players interact with visual objects; how players interpret meanings; and what interaction there is in the play. Game Practice, in this study, is defined as interaction between game and player and between player and player. Game Practice is separated from the Site of the Image and the Site of Audiencing; this will clarify investigation of the gameplay. Game Practice creates the context of the player situations in World of Warcraft between both player and game and player and player. Modalities are complex because they incorporate many modes. There are connections between the three modalities. To develop the analytical methodology, we need to understand the contexts of situation which occur during play and to classify the modes of analysis.

In his earlier works on linguistic theory, Firth (1950) divides Context of Situation into four components:

- the participants in the situation
- the actions of the participants
- other relevant features of the situation
- the effect of verbal action

Firth does not look at interaction in isolation; he integrates interaction with all the modes. Because he was writing about literature, Firth's work lacks further components which will be important in this research:

- player experience
- interaction between participants and objects

In digital games the situation is in virtual space; interaction between the player and the game world differs from Firth's verbal action. Dell Hymes (1974, 1986) expands Firth's concepts and lays down eight divisions of linguistic action:

- Setting and Scene – the time and place of a speech act

- Participants – speaker and audience
- Ends – purposes, goals and outcomes
- Act sequence – form and order of the event
- Key – clues that establish the "tone, manner or spirit" of the speech act
- Instrumentalities – forms and styles of speech
- Norms – social rules governing the participants' actions and reaction
- Genre – the kind of speech act or event

For this study, Hymes' important additions to Firth are the inclusion of 'time and place' and 'form and order' or 'chain of action' which can be applied to define the modes of the online game (will be described in the following section). Hymes does not go as far as to incorporate channels of communication, interaction and the role of participants. Halliday's modes interpret texts for social context; in gameplay, his work is relevant to the two worlds, real and virtual and the interaction between the two. Jones (2004) notes that the real and virtual worlds are not separate but overlap and interact; online interaction plays a role in and is part of the context of player-to-player interaction.

(II) Multimodal interaction (Norris's concept) of two components is adopted into the analysis of interaction to investigate a cohesive chain of action between modes.

- Lower-Level Action – the smallest interactional meaning unit
- Higher-Level Action – a multiplicity of chains lower-level actions bracketed by opening and closing

Norris's ideas were developed from Halliday who talked of 'cohesive chains' of meanings occurring in modes which link meanings inside texts. Norris, in the context of his theoretical study of novels, found Halliday's cohesive chains insufficient and further developed the concept of actions. 'Lower-Level Actions' combine to form 'Higher-Level Actions'. Higher-level actions connect to create chains of activity or interactions. This concept is adopted for this research. It can be usefully adapted to analyse gameplay and actions in quests composed of several tasks. More complex quests contain many chains of action.

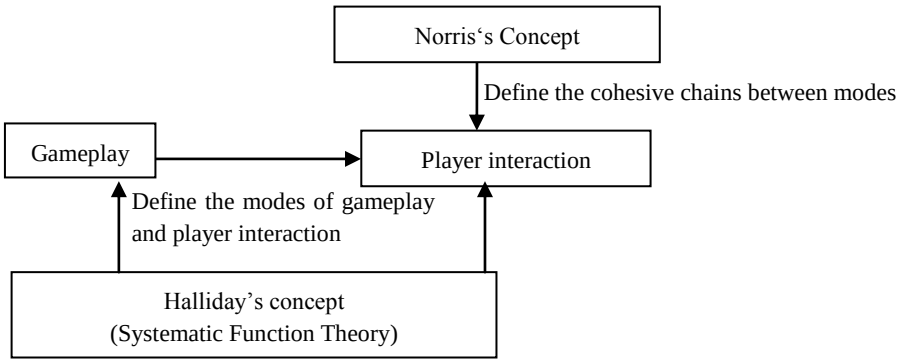

Figure 6-1 How existing frameworks will be adapted

To enable analysis of interconnections between modes, the analytical methodology has to be able to investigate all aspects, or modes, of the game including storyline, components and interfaces, gameplay and rules and how to play; this information was used as the foundation for subsequent steps. This is an analytical methodology of player perception; it was developed from Social Semiotics and Multimodal Interaction (see figure 6-1). The analytical methodology was set up in five stages. These stages are constructed from WoW online and literature from several sources such as official game manuals.

1. Conceptualisation – the nature and characteristics of the game
2. Categorisation and Quantification
3. Analysis of Gameplay to Define Interaction
4. Game Literacy
5. Interconnection Between Modes

Each stage is related to all the other stages. Stage 5 involves a reexamination of the first four modes to explore interconnections. The five stages will be explained and discussed later in the next section.

6.2 Developing Analytical Methodology from Gameplay Analysis

The scholar who investigates digital games must him- or herself plays to be able to understand the nature of the game and the player's mind and to be able to converse with players on their own terms. It is, for example, impossible to understand interaction and immersion and associated emotions without experiencing them. The pleasure lies in the excitement, completing quests, acquiring skills and abilities, and moving up skill levels. The deeper the understanding of the game, the deeper is the emotional attachment. Data collected for this study is in the form of video and software recordings providing high-quality moving images. O'Halloran notes that '… digital technology is multimodal social semiotic technology [for media discourse analysis]' (2009:4). Scollon and Levine state that the new technologies of video recording and data extraction are valuable for contemporary research into discourse analysis. It can be argued that this kind of data does not represent the true nature game playing; why, then, is it taken as representative for game analysis? Game data and players' behavior were simultaneously recorded. Weldon Kees, quoted by Scollon and Levine, wrote about the opening scene of a short film that '… the camera records the signals by which people announce their conscious or unconscious intentions of approaching , meeting, leaving, or avoiding one another (Levine and Scollon, 2004:6)'. Levine and Scollon supported the use of technology to capture expressive human behavior.

This study employs visual data obtained at a workshop for World of Warcraft players. Data was recorded from the real and virtual worlds. Studies of game interaction must consider not only the gameplay but also visual aesthetics and story-plots (see chapter 2). The story-plot is a series of events which take place during a quest in game territories which are constructed from visual elements. Visual

aesthetics derive from the visual elements in the game. In this chapter, three types of data are collected:

- Content Data
- Interaction Data
- Semiotic Data

Research data from the gameplay was obtained by:

- Recording World of Warcraft gameplay using appropriate software
- Video recordings to record players reactions during the game

If the visual grammar really exists, it will be revealed through the connections gameplay and the simultaneous video recordings of the players; the collected data should expose the links between events in the real and virtual worlds: when, why and how do players respond to visual elements and the game story? This is the primary methodological concern of this research. The data was sorted into different types such as player reactions, the quest, game story and visual interaction in preparation for analysis. Content analysis will be described later in this chapter. The various types of data were linked to visual aesthetics and, will be, in the next chapter, to the game story. In this chapter, a new approach to online game analysis is proposed. In the following sections player perceptions will be analysed from the perspectives of designer and player.

Stage 1: Conceptualisation

The first stage aims to understand the concept (i.e. nature and characteristics) of the game, its feature and gameplay and define modes of gameplay. The game features consist of its nature, storyline, theme, characteristic gameplay, interfaces and controls. Analysis of visual grammar commences in this phase. Appreciating the nature of the game is the first step towards understanding the whole game and its characteristics. The story and its structure determine design theme, visual design, characters, quests and gameplay. The first step is to define the genre, nature and characteristics of the game. Each online game, such as World of Warcraft, has its own characteristics. To describe the concept of the game, gameplay must be investated. Gameplay investigated in this study derives from two sources: the author's own gameplay and the gameplay workshop. Gameplay was analysed to create a new analytical methodology for player experience and interaction.

(1.1) About World of Warcraft

The investigation started with the author playing World of Warcraft and collecting data. Gameplay is based on quests controlled by the storyline. World of Warcraft stories are set a planet called Azeroth where there is a long history of conflict between two factions; the Horde and the Alliance. The Horde is composed of six races: Blood Elf, Orc, Tauren, Troll, Undead and Worgen. The alliance is made up of five races: Draenei, Dwarf, Gnome, Human, Night Elf and Goblin. Three

expansion sets were applied to World of Warcraft to create, with the original, four versions of the game:

- The Beginning of Azeroth (original version)
- The Burning Crusade
- The Wrath of the Lynch King
- Cataclysman

Players can choose which race their avatar will belong to. They can also choose a class for their avatar from the following: Death Knight, Druid, Hunter, Mage, Paladin, Priest, Rogue, Shaman, Warlock and Warrior. Each class has its own abilities, skills and traits. Some classes have higher skills and some combinations of race and class are not allowed (for more detailed information see www.wowhead.com/news=174515/cataclysm-new-class-race-combinations). The World of Warcraft handbook states that players' avatars cannot be Goblins or Worgen is they do not have expansion packs; if they want to change their class to Death Knight, they must have a skill level of 55 and the Wrath of the Linch King expansion pack (Davis 2011).

A game is made up of many quests; each quest requires the player to perform at least one task, usually two or three, but sometimes more. The player gains experience from the tasks and quests. Blizzard Entertainment offers different types of quest:

- Breadcrumb Quests
- Collection Quests
- Kill Quests
- Escort Quests
- Quest Chains

Since new quest types are always being launched, this list is not exhaustive. Some new quests have not yet been classified by type but have to be assigned a type for this research.

(1.2) Analysis of the author's own gameplay and of the game workshop

The analysis adopts the three components of Systematic Function Theory and their analytical methodology (Dietic, Epithet and Thing) to define game activities (or modes of gameplay), player profiles (avatar characteristics) and interaction (or modes of interaction such as dialogue, movement, visual interactions), symbolism (visual elements), and to identify components of mode and meaning.

The analysis starts from a World of Warcraft workshop for fifteen players: this workshop was held at Mae Fah Luang University, Chiang Rai, Thailand in November 2011. Each player's gameplay was recorded for half an hour; the players themselves were video recorded during their gameplay; thirty-minute interviews were conducted with all players individually. The fifteen players play the game in ninety-nine quests. The gameplay, video recording and interview of one randomly selected player of one quest is discussed and analysed in following detail.

The randomly chosen player is known as Player A; one quest was selected from the ten that he played: 'Aid for the Wounded'. The quest is set in Coldridge Valley in the pine woods.

According to the analysis of gameplay of Player A (the plate 8), the modes of gameplay can be classified as follow:

(i) The avatar profile (player profile) details:

Player ID – Player A (video clips from game workshop: Player A)

Player A chose a Dwarf for his avatar and Hunter as his class; he had a bear as his pet to act as a guard and protect and fight for him.

(ii) Characteristic Quest is the component of the quest; it consists of Quest name, quest details, Quest giver, Quest aims and Quest rewards.

> *Quest Name* – 'Aid for the Wounded'; quest item – 'Sten's First-Aid Kit' – used to treat four wounded Coleridge Mountaineers in fifteen seconds 'cooldown' (a World of Warcraft term meaning 'the time during which an item cannot be used following its last use').
>
> *Quest Details* – In the words of an NPC: 'Many of those that y'saved have already made it back to camp! Their wounds're well-dressed! Ye might have a future in first aid, if ye're into that sort of thing!'
>
> *Quest Giver* – Sten Stoutarm
>
> *Quest aims* – to aid for the wounded; then return to Sten Stoutarm in Coldbridge Valley
>
> *Quest rewards* – 35 coppers, 170 expereinces 250 reputations with Ironforge

This quest cannot be categorized as one of the four quest types of Blizzard Entertainment. The quest type needs to be clear in order to analyse the aims of the gameplay; moreover, the game workshop consisted of ninety-nine quests performed by fifteen players. Many quests cannot be categorised; this type of quest will be discussed and classified in the next stage.

Plate 6-1 the gameplay strip of the quest 'Aid for the wounded'

(iii) Game activities

Game activities can be unfolded by deconstructing the gameplay videoclip and story which we can call the 'quest story' or 'gameplay story'; subsequently, the story can be divided into manifestations of game interaction. The gameplay videoclip can be analysed in detail as follows:

The gameplay strip in plate 6-1 shows how the game starts with the player's avatar receiving his quest and a useful item, which he puts in his backpack, from the NPC Sten Stoutarm.

- He, the avatar, walks out of the camp using the navigation map to find the quest target (00:00:08).

- The player, through his avatar, uses his gun to shoot a monster which is trying to kill Coldridge Defender (in the quest) (00:00:33).

- He clicks on an item that Sten had given him but it does not work (00:00:50); he tries twice more but it still does not work, confirming that Coldridge Defender is not one of his targets. He searches for other NPCs. He finds a new NPC, from the Wounded Coldridge Mountaineers, who is kneeling; the avatar and the Wounded Coldridge Mountaineers belong the same race – they are Dwarfs; he has succeeded

in finding his first target, his first success in the quest. The quest items now work so that he can heal the Wounded Coldridge Mountaineer's wounds.

- He runs to find more Wounded Coldridge Mountaineers looking like the first one (00:01:23).

- He finds a second Wounded Coldridge Mountaineer whose wounds he also heals, his second successful target. His third target appears to have been injured by a Rockjaw Goon; he shoots this monster and its bear which is running to help him (00:01:40). After killing the monster, he heals the NPC. He stops for a while to watch a rabbit jumping. He also finds and heals another Wounded Coldridge Mountaineer. He has healed four Wounded Coldridge Mountaineers successfully; the fourth Wounded Coldridge Mountaineer tells the player that he has completed his quest successfully.

- On his way back to camp, he encounters yet another Wounded Coldridge Mountaineer whom he also heals (00:02:05). The player discovers how to make his avatar jump to make it move faster to hurry back to camp to return his quest.

The quest story can be broken down into events:

1. Sten Stoutarm puts out a 'Call to Adventure'.
2. The player accepts the quest and is given a useful item.
3. The player walks from the camp to the battlefield (Crossing the First Threshold (00:00:08).
4. He sees an NPC shooting a monster. He shoots a monster (00:00:33).
5. He tries out one of his quest items on the NPC but it does not work.
6. He finds another NPC who is kneeling and applies the quest item.
7. He succeeds in healing her indicating that she is his target, a Wounded Coldridge Mountaineer (00:01:23).
8. He finds another two NPCs and heals them.
9. He kills a monster (Rockjaw Goon) with help from his bear (00:01:40).
10. He watches a rabbit jumping.
11. He heals a fourth NPC and who tells him that he has completed his quest.
12. He goes back to the camp to report.
13. Along the way back, he heals another NPC (00:02:05).
14. He learns how to jump while running.
15. He returns the quest.

The story contains fifteen events. The player has learnt how to use the quest item to heal NPCs who are of his race. Blizzard Entertainment's quest categories (see chapter 3) do not satisfactorily cover all genres; additional categories have been added to their list for the purposes of this research. The events can be considered to be plots which, in sequence, are the story of the quest; a 'plot' is 'the meaning of an event'. To be a story many events or plots connect. The nine 'events' or 'plots' are the 'story' or 'story-plot' of this World of Warcraft game. The concept of the story-plot was discussed in more depth in this writer's previous paper: 'Interactive

Narrator in Ludic Space: A Dynamic Story Plot Underneath the Framework of MMORPGs Storytelling System'. The story, or story-plot, is a quest which we will call 'quest story'. The quest story is a series of interactive events which take place during gameplay. The quest story is different for each player and event for each player participating in the same quest because freedom or action is not the same for all players and players will make different choices. All players will have different plots; therefore all players of a quest will have different quest story. The quest story and the story-plot can be used to investigate **the interaction and experience during gameplay**.

(iv) Interaction (modes of interaction such as dialogue, movement, and visual reaction) will be discussed in the next stage.

(v) Game interfaces and controls were discussed in the previous chapter (chapter 5); therefore, these analyses will not be repeated in this chapter.

(vi) Symbolism (visual elements) will be discussed in the next stage.

(vii) Identifications of components of mode and meaning will be discussed in the next stage.

(viii) Features of gameplay are described as follows:

Game documentation, online or in print, is valuable, as is Machinima (a videoclip of gameplay made by player), cut scene (short, animated real-time films using the game's graphics for opening or connecting scenes), to achieve a deep understanding or the game. An inventory of the game's features and interfaces is required to enable analysis of User-Generated Content (UGC); the game allows players to modify features for convenience such as by combining keys or adjusting interfaces. Davidovici-Nora describes UGC in World of Warcraft thus: 'The gameplay and the interface of the game are continuously evolving under community of players' actions and editor's reactions. Co-creation is a form of continuous dynamic customization (2009:64). Players can take on the role of creator in two ways. One is through the story in the gameplay; the other is by varying artistic and technical content. The game's concept and features have to be defined before Stage 2 can be undertaken. Gameplay in the virtual world and players playing in the real world need to be recorded for use of scholars. Scholars investigating online digital games must themselves play and gain experience. Documentation will be used to construct the features of the WoW gameplay; it is summarised and described from my own perspective in table 6-1.

Table 6-1 Features of gameplay

Features of WoW gameplay	**Characteristics Exemplified in World of Warcraft**
Storyline	War and conflict between two factions of mythological races on a planet called Azeroth
Characters	Mythological and fictional characters and monsters
Gamescape (Territories)	Fantastic, warfare, unnatural landscapes
Game Objects	Usually unrealistic such as floating trees, dragonhawk
How to Play	Can be player versus game (Normal realms), player versus player or group play; controls and interface unique to the game – must be learnt for this game.

This study investigates World of Warcraft with the intention that it should represent all online digital games. Experience is gained by joining in the game but basic knowledge of the game is a prerequisite. Basic information about World of Warcraft derives from different sources: official game manuals, either as hard copies, or downloadable software which can be bought from the webstore after buying the game; unofficial web game databases such as wowwiki.com and wowhead.com; and the Machinima of World of Warcraft. It also helps players to join game communities on the internet.

The next gameplay analysis illustrates the author's own experience. This gameplay illustrates the nature of the game and helps scholars to understand the modes of gameplay: how many there are and how they influence players. Some modes at some levels operate only if the player is addicted. All these points are useful for investigation.

During eighteen months of investigating online gameplay by playing World of Warcraft, I participated in about a thousand quests, rising to the highest quest level and eighty-fifth skill level in the forth version of the game. Joining the WoW through online gameplay, it helps to understand the nature of the game, a way to play the game and solving the problem including task problems from quest, the guide for analysis and feeling of pleasure and addiction. The following two parts record my initial play illustrated by video recordings and gameplay recorded on software.

Part One:

Gameplay from the writer's own experience (see video clip Journey 1 and figure 6-2):

> *"I am playing World of Warcraft (WoW) for the first time. Before starting to play, I had had to find information about the game: how to play, where to start and about the first task of the first quest. I stared by searching the internet; there are many blogs and websites for new players. As well as this information, the game manual is useful; it is packaged with the software in a box when you buy the game* (be adopted to frame the stage 1). *After I had studied the WoW game Cataclysm, I logged in and chose to be a Blood Elf in the person of my avatar and a single player land of the Hordes. The game limits choices for beginners including the characteristics of his or her avatar. The first step is to choose class, race and gender to which are assigned particular skills and powers. I hope to gain more magical powers during the quest including healing powers which can restore heath whilst fighting (*be adopted to frame the factor for analysis: 'Avatar selection'*). I, in the person of my avatar, am taking part in the training course for my race and class. I am learning to control my avatar – walking, running, jumping and fighting – for which I will be assigned a skill level (*be adopted to frame the factor for analysis: 'Playing experience'*). To start the first task, I have to survey the gamescape in a location called Sunrise City. My avatar comes to life in Sunrise Hall. The Hall is a high, round building with two floors connected by a spiral staircase. On the first floor (figure 32), I can see many avatars and NPCs (Non Player Characters) in front of the wall opposite, facing the centre of the room, leaving the middle of the room free. There are also chairs, trees and lights alongside the wall. Most of the avatars are Blood Elfs; they are trainers, guardians, merchants, etc. At first glance, I can see monsters; there are also cats running. Magic brooms are cleaning the floor and trees are floating in the air. The middle of the floor is covered with a big round, red carpet with a thick yellow circle symbolizing the centre of power. The floor is made from variously shaped, big stones and the gates have a design on overlapping triangles with vines spiraling round the door frame(*be adopted to frame the factor for analysis: 'Gamescape /Environment').

> *Walking around and talking to the other avatars, I am learning to play and understand the game world. I accept my first task from the Blood Elf Council in the hall: kill ten Springpaw (sabre-tooth tigers) and Green Monsters (walking trees). Controlling the Blood Elf in third-person perspective, it is easy for me face these strange creatures whilst retaining an overview of the landscape to avoid getting lost (*be adopted to frame the factor for analysis: 'Game object' and 'Direction'). *It seems better to run than walk to get up to speed. I use a short knife to fight the Green Monsters but it's hard to fight them and I spend a lot of time fighting. I learn that I must swing the short knife more than seven times to kill them;*

they make a sound indicating that they are dying. As I examine a body, the interactive box pops up and shows me some things that I can take out of my property bags. I am surprised to be rewarded with armor, gloves, swords, etc. since I have killed one Springpaw too many (be adopted to frame the factor for analysis: 'Encouragement'). *I am learning to kill other creatures to sell later; I had read about this in the handbook."*

Figure 6-2 the gameplay of the Sunrise town

Part One illustrates the author's own experience as a new player. Players start with basic information about the game: how to install it and how to play. This experience showed that, for information not available in the manual, the internet is a good source of advice. It was helpful for searching for information to apply during play and for solving problems; it enabled this study to progress and was the first application of analytical methodology in this chapter: Conceptualisation.' The selection by the player of his or her avatar's class, race and gender influences the visual design theme and the story. This writer enjoyed the game environment and visual design; other players, when interviewed, confirmed that they enjoyed the same aspects of the game (as described in part two). The first time of playing is a learning experience: how to control the avatar, how to play and how to make progress through the game.

Part two:

Part Two records (illustrated by videoclips and see the plate 6-2) the author's subsequent experience in conducting a higher level quest.

> *"After completing my quests in Sunrise City, and attaining higher-level skills, I was able to travel to the next game city. I rented a Dragonhawk and flew across Dead Scar and Eversong Woods and arrived at Falconwing Square. I controlled my Blood Elf avatar along Dawning Lane crossing a river at a small bridge; the initially tranquil background music changed into a more lively and grander theme to suggest an adventure when arriving at Silvermoon City, the next city after Sunrise*(be adopted to frame the factor for analysis: 'Sound'). *I followed the same procedure as before; I surveyed all rooms in the new building new weapons or food; I expect to find a new quest here. A Blood Elf in front of the building in Falconwing Square handed me my new quest. I have to find the Thaelis Head to obtain rewards and attain a higher skill level; I had to hurry because quests completed quickly attract greater rewards and promotion to higher skill levels. I ran along the road hoping the find the right target. I had gained experience of using the navigator map in the part one. I used the navigation map again to make it easy to find the target; it took me several minutes to locate the target: a building called 'Ruins of Silvermoon'* (be adopted to frame the factor for analysis: 'Deciding on the next action'). *Whilst searching for the entrance, I was confronted by two guards whom I slew; I looted their energy food. I later went into the Commons Hall and confronted the guard and his boss together; they killed me. I was a ghost for a while before being reborn in the graveyard. I returned to the city to find a new weapon before setting out to fight them again. I did not find a weapon. The innkeeper used her magic to make this my home location. During the game, I sometimes stopped playing to look around new territories and listen. The gamescape that I encountered most often was a landscape garden visible from a long way away; zones were designed for particular purposes inhabited by their own creatures. Everything was on an enormous scale: trees, buildings, furniture, etc.; even the grass was outsized. Close inspection, however, revealed no detail in the leaves or in any object. Some trees are modeled on planes and mapped with tree-like texture; we see a tree whose shape and colour are a metaphor for a real tree* (be adopted to frame the factor for analysis: 'Colour and Lighting'). *The positioning of trees and their relative sizes create the illusion of three dimensions; a variety of different colours have been applied to the trees* (be adopted to frame the factor for analysis: 'Three-dimensional illusion'). *With mountains, likewise, colour is applied aesthetically to create emotion in World of Warcraft. Sound effects like footsteps sound different according to surface such as on grass, rock or floor. There are other sounds such as a fountain and birds singing. Background music sometimes reflects the activity or inactivity of*

the avatar; sometimes it encourages the player to progress through the game. Sound imparts qualities of intensity and frequency which create the feeling of a real environment and a 'reality' of existing in a game world (be adopted to frame the factor for analysis: 'Type of sound').

'Now I am standing in front of the gate of the ruins of Silvermoon Hall screenshot 1: 00:00:33). Now I am looking round a room to work out how many creatures I have to fight and what the chances are of winning. There is a big fire in the middle of the room. There are four creatures looking like zombies (Thealis the Hungerer): one, standing close to the fire, has a long-handled scythe; the others who hold short knives are walking round him. The one with the scythe is obviously the leader. I am trying to decide what to do; these creatures have similar potential to me in a fight. I have no companions; nor do I possess the most suitable weapon; furthermore, I lack powerful magic. I move close to the wall for safety; they cannot attack me from behind; it should be a good location for a fight; I can take them down one at a time, their leader being the last. I took a few minutes to sort my weapons out; I selected the best one, the one which is able to do most damage. I also updated my armor for better resistance and healing. All creatures can indicate that they are still alive by way of small movements such as breathing, hand or head movements or they may still be standing. These details help to create the illusion that the virtual world mirrors the real world (be adopted to frame the factor for analysis: 'Realism').

I am stepping back to the wall for moving from one corner to the other searching for a new location from which to attack the three Hungerers one at a time; unfortunately, there is a loud noise of a Hungerer behind me, anxious to attack before I can reach the main gate. Blood spurts out of my avatar. A floating "-9" pops up. I am losing that amount of life (be adopted to frame the factor for analysis: 'Emotion'). *I turn round and swing my stick to fight back. The Hungerers' leader joins the fight. My strategy is the keep moving whilst fighting back but it is not a good decision. I am trying use magic to open a magic door but it takes time and there are conditions. I die. I have learnt that to run away during a fight means certain death* (be adopted to frame the factor for analysis: 'Obstacles'). *My spirit appears, transparent and transposed to a new location, a soft white shape. The usual sounds have stopped. A new sound like wind evokes death. I accept a new life from the spirit healer. She performs the rite to resurrect me with no loss of experience or property (00:01:40). Following the rite, my reincarnated avatar appears in the graveyard in Eversong Woods and is ready to fight again. I direct my avatar across a grass field, Falconwing Square, and return to the ruins of Silvermoon Hall by the same route as before but before getting there I decide to return to the town to find new weapons and armor whith which to fight the Hungerer* (be adopted to frame the factor for analysis: 'Direction')*s. I start talking to people in Falconwing Square. I search*

everyone there but find nothing. I enter Silvermoon Hall. It is Horde territory. I am searching for another way to fight the Hungerers. In the Hall, a merchant is selling items looted from dead creatures. I want to buy new armor and weapons (00:05:34). With the gold and coins that I have, I am able to buy a pair of leather gloves, drinking water and bread for fast recovery (00:06:41). I ran across the garden until I reached the ruins of Silvermoon Hal. I considered that waiting in the main gateway would be a good strategy to enable me to fight the Hungerers one at a time. As my avatar enters the main gate, two of the three Hungerers come towards me so I run back to the main road and keep running until they stoped following me(00:08:54) and went back through the gate. I return to the gateway. The Hungerers leader had not emerged; this would be a good opportunity to defeat him. I managed to kill one guard on the step. I sat down to eat the bread to recover my energy (00:10:34). I defeated the Hungerers' leader in the gateway the same as the guard. I used magic to transport the Thealis Head back to town, thus completing the task and getting rewards and a higher skill level (11:12:48).'

The gameplay of Part Two provides evidence of storytelling and player experience. Events unfold through interaction. The major events in the gameplay are as follows:

1. Flying a Dragonhawk to Falconwing Square
2. Obtaining a new quest, to bring Thealis Head back
3. Searching for the quest target
4. Confronting the two guards outside the Commons Hall in the ruins of Silvermoon City; slaying and looting items from them
5. Entering the Commons Hall to confront Theaslis the Hungerer's boss and guards; lose the fight.
6. Reincarnated at the graveyard; searching for new weapons to fight the Hungerers again
7. Return to fight the Hungerers' boss and slay him
8. Using magic to transport Theaslis the Hungererback to Falconwing Square
9. Getting a reward for completing the quest and being promoted to the next skill level

Plate 6-2 the gameplay strip of the quest 'Wanted Thaelis the Leader Hunger'

In the author's own gameplay, the quests were all either delivering items or killing things: similarly with players in the the game workshop. These types of tasks are provided for new players (to be discussed in stage 2); some tasks are complex and mix many quests. The author found that game mechanics is set up to offer new quests before completion of current ones; players generally are unaware of the mechanisms. Blizzard Entertainment lays down five categories or genres of quest; scholars have also tried to establish genres of quests; these are unsatisfactory because most quests do not fall easily into any one category. A new system to categorise quests is required to enable gameplay analysis to proceed. Quest type will be investigated by examining tasks and their aims derived from experience gained during gameplay; new quest types will be established during the initial analyses of gameplay. The new quest types will be employed to investigate interactions of players with the game.

The author's gameplay stories and playing experience will be used to extract possible factors to analyse gameplay of other players in the game workshop. Some analytical factors are components of visual grammar from chapter 5, for example Movement, Camera Perspectives, Three-Dimensional Space, Direction, Sound and Characters. The factors to be utilised for gameplay analysis will be:

(a) Emotion – refers to a feeling in which a player derives from WoW including playing skills
(b) Encouragement – a factor which encourages a player to continue playing or, conversely, bores the player
(c) Obstacles – refers to problems which discourage a player from continuing to play
(d) Choice of Avatar – reasons of choosing a particular avatar; player's feelings for his or her avatar
(e) Gamescape/Environment – feelings about the landscape of WoW (to be adopted from the chapter 5)
(f) Realism – refers factors in which create an illusion of realism within the game
(g) Game Object – features of the game including sound, sets and props
(h) Colour and Light – how colour and light design in the game influence players (to be adopted from chapter 5)
(i) Visual Memory – the first thing that a player remembers after playing the game – visual recognition
(j) Movement – the sense of movement in the game; movement of either player or object (to be adopted from chapter 5)
(k) Space of Play – space on the screen where players can move around
(l) Three-Dimensional Space – the illusion of three dimensions and sense of depth in which players' avatars can move, walk or fly into (to be adopted from chapter 5)
(m) Direction – directions; clues which help players to know where they should go (to be adopted from chapter 5)
(n) Players' Experience (before and after play) – experience of play before and after the game workshop
(o) Other Avatars/NPCs – feelings about NPCs or other players' avatars (to be adopted from chapter 5)
(p) Deciding on the next action – how players know what to do next
(q) Sound – emotions from sound and role of sound to the play (to be adopted from chapter 5)
(r) Type of Sound – classification of sounds (to be adopted from chapter 5)
(s) Perspective/Camera Movement – first- or third-person perspective; camera angle and framing (to be adopted from chapter 5)
(t) Learning Experience – what did players learn from playing WoW ?

The twenty factors will be used to analyse player experience in the fifteen players in the next stage; interview questions have to be composed to elicit responses in line with the factors. These factors similarly provide the terms of reference for analysis of the video clips.

Stage 2: Categorisation and Quantification

In stage 1, modes of gameplay and their features were defined. The investigation of modes needs to correspond with the main research questions in chapter 1. Some modes have already been examined in the previous stage; however, there are more modes to be considered including Type of Quest and Interaction. This stage will, therefore, categorise and quantify the remaining modes. This stage will commence with game characteristics and then look at type of quest; these are necessary components to examine gameplay and interaction.

(2.1) Categorisation and Quantification of Characteristics of WoW

Online digital games have their own characteristics; some modalities are similar in other games because game designers assemble games from common components such as storyline, rules, quest, and mechanics. The basic modalities of WoW are game content, visual elements, interactions and social semiotics. 'Game contents', in this chapter means storyline, types of quest and the cut scenes. As previously described, the storyline is the programmed structure of the game as a whole; story plots are controlled by the structure. Plots are governed by cause and effect; plots link quests (see the analysis of stage 1). A different quest story is created every time a player undertakes a quest. Each player creates his or her own story plot within limitations of the quest structure. The game story is not linear; it is interactive. Players are free to choose quests under umbrella of the storyline; different types of quest are on offer. Players, individually or in groups, create their own storyline; they are co-creators with the game designers. Sanders and Stappers (2008) described a user [game player] as a 'co-designer'; they can create objects inside the game; this is the case with World of Warcraft. A 'cutscene' is a brief animation in 3D computer graphics; a cutscene introduces new quests, quest stories and sub-stories and bridges game territories explaining contexts, time and space. Another mode of Game Content is Visual Elements: Characters, Props, Sets, Sound and Gamescapes (territories). Visual Elements were discussed in chapter 5. Characters can be either avatars who represent players or Non-Player Characters (NPCs) which are generated by the game. Props are decorated objects in the gamescape including weapons, armor, vehicles, etc. I would propose 'Gamescape' is the landscape as it is seen on screen; other terms define geographical areas; their relationships are illustrated in the following table (table 6-2) with examples:

Table 6-2 Geographical areas of World of Warcraft

Geographical Entity	**Examples from**	**Entity**
Planet		Azeroth, Outland
↓		
Continent	Azeroth:	Northrend, Kalimdor, Eastern Kingdoms
↓		
Zone	Northrend:	Borean Tundra, Crystalsong Forest, Dalaran
↓		
Territory	Borean Tundra:	The Nexus, Desth's Stand, Amber Ledge - forests, sea mountains, city, sky, etc.
↓		
Locations	The Nexus:	Coldarra, Transitus Shield, The Nexus - forests, sea mountains, city, sky, etc.
↓		
Gamescape	on screen view	

The player creates his own avatar; the avatar represents him or her in the gamescape, the virtual space which may be shared with other players. There are also non-player characters (NPCs); they are either human in form or they are creatures or spirits. Avatars and NPCs require decorated sets and props (game objects) such as clothes, weapons, houses, food, medical aid, transport and other items to support the quest. Players interact with game objects and characters. Interaction depends on the type of game but some types of interaction are common to all games such as asking for, accepting or rejecting a quest, fighting, trading, looting, and movement including walking, jumping, running and diving.

For analysis in stage 1, the quest 'Aid for the Wounded' is categorized as an 'Aid Quest' (the type of quest will be described in the next section). This gameplay can be categorized and divided into modal elements as follows:

The mode of visual elements: the territory is a valley flanked by snow-covered mountains and pine forests. The camp is encircled by guards, beer tanks, carts and is clear of the surrounding by snow; the road leading to quest targets is, likewise, clear of snow. Guards protect the road and the way is illuminated by a light house. The design of the props adheres to the 'Dwarf' theme; the props reflect the character of the short, stout, talkative Dwarfs. They like beer: hence their beer tanks. They are hunters and like fighting; they have long hair and beards.

The mode of sound: we can hear gunshot, fencing and screaming. The sounds of running and walking are differentiated as are the steps on different surfaces such as ground and snow.

The modes of activities in this quest are represented by searching for quest targets; trying out quest items; aiding wounded characters; shooting monsters; and looting from dead monsters.

(2.2) Categorising and Quantifing Quests

The study starts with analysing the fifteen gameplays from the workshop. These fifteen gameplay videoclips are investigated to classify the details of the quests and their characteristics. The fifteen gameplay videoclips consisted of ninety-nine quests performed by fifteen players, they are:

Player 1– 10 quests: 1 killing quest; 3 object delivery quests; 2 gathering quests; 2 training quests, 1 quests aiding NPCs; and 1 apprentice quest.

Player 2 – 19 quests: 8 killing quests; 6 delivery quests; 1 training quest, 1 quest aiding an NPC; and 3 miscellaneous quests.

Player 3 – 5 quests: 2 killing quests; 2 delivery quests; and 1 gathering quest.

Player 4 – 6 quests: 1 killing quest; 3 delivery quests and 2 miscellaneous quests.

Player 5 – no quests.

Player 6 – 12 quests: 1 killing quest; 6 delivery quests; 1 gathering quest; 2 training quests; and 2 mixed-task quests.

Player 7 – 8 quests: 3 killing quests; 1 delivery quest; and 4 gathering quests,

Player 8 – no quests.

Player 9 – 7 quests: 1 killing quest; 2 delivery quests; 2 gathering quests and 1 training quest.

Player 10 – no quests.

Player 11 – 5 quests: 2 delivery quests; 2 escort quests and 1 training quest.

Player 12 – he performed 8 quests: killing 1 quest, delivery 4 quests, training quest 1, miscellaneous 1 quest and mixed tasks 1 quest.

Player 13 – 2 quests: 1mixed-task quest; and 1 delivery quest.

Player 14 – 6 quests: 1 killing quest; 4 delivery quests and 1 training quest.

Player 15 – 8 quests: 2 killing quests; 4 delivery quests; 1 training quest; and 1 miscellaneous quest.

All ninety-nine quests can be categorised into thirteen types as shown in table 6-3. All the quests can be placed into one of thirteen categories; three players performed no quests (see table 6-3). Delivery quests were the most performed (38.38%) and killing quests second (21.21%).

Table 6-3 Quest categories in the game workshop

	Quest Categories													
Player No	**No quest**	**Killing**	**Delivery**	**Gathering**	**Escort**	**Faction**	**Chain**	**Elite**	**Dungeon**	**Training**	**Aid**	**Miscellaneous**	**Class**	**Hybrid**
1		1	3	2						2	1	1		
2		8	6							1	1	3		
3		2	2	1										
4		1	3									2		
5	1													
6		1	6	1						2				2
7		3	1	4										
8	1													
9		1	2	2						1				
10	1													
11			2		2					1				1
12		1	4							1		1		1
13			1											1
14		1	4							1				
15		2	4							1		1		
Total (99)	3	21	38	10	2	0	0	0	0	10	2	8	0	5
%	3.03	21.21	38.38	10.10	2.02	0	0	0	0	10.10	2.02	8.08	0	5.05

Other unclassified quests which cannot fit into the list of quest types came to light during the writer's own gameplay through the experience of undertaking about a thousand quests. Here are two examples of unclassified quests are with another two which fit existing categories (table 6-4):

Table 6-4 Unclassified quests

Quest Sample	Quest Name	Details	Observations
1	A Sprit Guide (not fit)	Use Wolf Totem at the location where you found Krun Spinebreaker's body and follow the Ancestral Spirit Wolf.	A mixed quest: part training and part assigning a new task.
2	Dimensius the All-Devouring	Report to Scourge Commander Thalanor on the first-floor balcony of Ebon Hold.	Task to deliver quest item to NPCs.
3	Report to Scourge Commander Thalanor	Professor Dabril at the Protectorate Watch Post in Netherstrom wants you to speak to Captain Saeed and then follow his army to Manforge Ultris and kill Dimensius the All-Devouring. (Suggested number of players: 5.)	Players ordered to form a group and lead NPCs to battle with a high-class enemy.
4	Basic Training (not fit)	Raelorasz at the Transitus Shield wants you to slay ten Coldarra Spellweavers. "This is war, mortal, and we are the tip of the spear. Your little spats over land or currency pale in comparison to this conflict. We face the aspect Malygos and his entire blue dragonflight. All you need to know is that is he is victorious; this world shall be no more. We are but few here, and we fly against many. Our deaths are all but a certainty, and our ultimate success lies in merely delaying our enemy. Go now. Busy yourself while I decide what to do with you."	Training players with new skills and exploring a new gamescape.

These quest samples do not fit into established categories and have their own objectives; we need new categories. Quest sample 1 spans two categories; a new

quest is proposed to be known as 'Hybrid quest'. Quest Sample 2 and 3 fit into existing categories of Delivery Quest and Faction Quest. Sample 4 will be allocated to the new category of Training Quest. Thirteen quest types are now proposed based on the original list of nine; in addition to new categories, one of the original categories has been divided into two. Quests categories derive from:

- The character of the tasks in the quest
- The gamescape
- The length of the game (time)
- Level of difficulty and players' skills
- Restriction of race or class for some games
- Rewards and new abilities and skills acquired

The quest categories for this research are:

Quest Category	Established or New	Characteristics
Killing or **Destruction** Quest	Established as Killing Quest; Destruction added	The initial task of a game; the quest orders players to slay a given number of monsters or NPC. Players may play individually or as a group sharing rewards.
Delivery Quest	Established	The player delivers an item to an NPC or places it somewhere.
Gathering Quest	Established	Players collect specific quest items usually when entering a new territory; it lets players explore the gamescape. Players may have to slay creatures to gather items. Players may play individually or as a group sharing rewards.
Escort Quest	Established	The player must deliver NPCs or animals to a specified location within a given time. During the journey, the player must help the NPC or animals to fight opponents who usually have high power. When the quest is over, the player will get high rewards and be given high-power weapons.

Faction Quest	Established	The player leads a group of NPCs to battle against high-power opponents. It is difficult but the player gains experience and is given a high-power weapon. The quest has to be completed within a specified time and must remain alive
Quest **Chains**	Established	Many quests; when the player has completed one quest he or she will be given another quest. It may start with an easy quest and continue with harder ones. These quests are derived from the story line.
Elite Quest	Established; Originally Elite and Dungeon Quest but now separated into two categories	Difficult quest in which player meets high-power opponents; The player must have a strategy and it takes more time to complete. Sometimes players form a group to challenge the quest. Suitable for highly skilled players.
Dungeon Quest		Special quests announced during other quests. The quest takes a group of players to the Instance Dungeon, a special location in WoW (Blizzard Entertainment 2007).
Training Quest	New	An assignment designed to increase skill level or gain new skills such as how to use a kind of magic, weapon training or learning to ride a horse or dragon.
Aid Quest	New	The player obtains a quest item from an NPG usually giving him or her the power to heal NPCs or animals.
Miscellaneous Quest	New	A quest which does not fit easily into any other quest category. It usually involves a special task such as climbing a pine tree to help bear cubs; operating a machine to destroy

		targets in a limited time; or commanding players to dance whilst following an NPC.
Class Quest	New	A quest for one class of avatar only; trains players in abilities and skills applicable to their class such as collecting herbs to make medicines or mining gold.
Hybrid Quest	New	Combining features of more than one quest category; a complex quest; for example obtaining quest items, destroying creatures and constructing a quest object all in the one quest. The quest might, for example, require a player to collect objects and create a weapon from them.

Each player's gameplay data are assigned to one of the thirteen categories. The thirteen quest categories will help us to evaluate quest aims and players' experiences and emotions in the context of analysis of gameplay and player interviews. Players were interviewed about their gameplay and experiences the day they had played. These thirteen quest categories will be used to analyse the gameplay and construct the factors of analysis in the following step.

(2.3) Categorisation and Quantification of Analysis of Player Perception

The gameplay workshop interview and analysis

Fifteen World of Warcraft players were invited to participate in a workshop with each player playing for thirty minutes. Gameplay data were gathered from the game and from the real world through game-recording software and video recordings. During the interviews, participants were shown video recordings of themselves playing so that they could comment on their interaction with the game. In the interviews, open questions allowed players to describe their own experiences. The diagram in figure 6-3 illustrates the workshop process. The questions were designed to encourage students to describe their experiences in their own words.

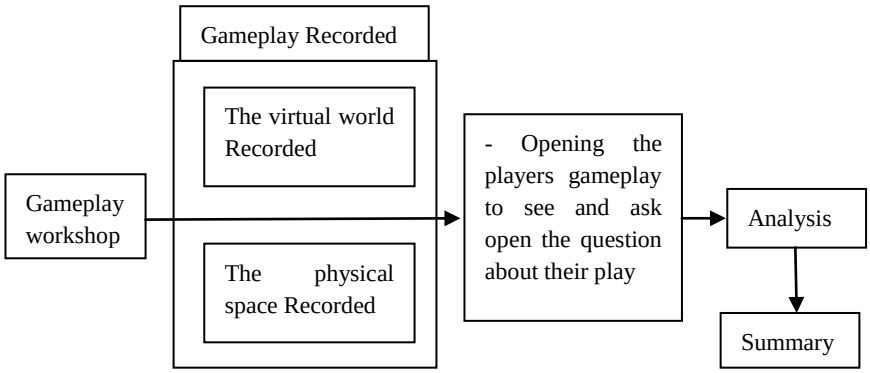

Figure 6-3 The gameplay interview diagram

The interview was divided into five parts:

- Object Classification
- Object Selection
- Object Usage
- Meanings of Objects
- Immersion Experience

The results of gameplay analysis from the stage 1 are used to design the gameplay interview in this section. The questions covered visual elements and game objects. The questions, composed by the author, were:

1. How do you feel about this game?
2. Why do you feel this way?
3. What are the main factors or game objects that make you feel that way?
4. What bores you in the game or interrupts your play?
5. Why did you choose your character? How did you feel about your character during the game?
6. What do you think about the gamescape?
7. Do you think that the game world is real or virtual? What factors or objects make you feel that way?
8. What do you think of the shapes of game objects (avatars, buildings, trees, weapons, monsters, pets, etc.)?
9. Did the shapes of objects help you to play well or not?
10. What did you think about colour in the game? How did you feel about it?
11. What do you think about realistic game objects?
12. What object dominates the game? Would you recognise it after you have finished playing?
13. How do you feel when you move your avatar?
14. What do you think about space in the gamescape?

15. What do think about moving in three dimensions in the game?
16. What do you think about direction in the game? How do you know the right direction? Which game object tells you the right direction?
17. How did your feelings about the game change during play?
18. How did you feel about other characters' movements including monsters?
19. How did you know what your target was? How did you know what your next move was to be?
20. What did you think about sound in the game? What did you think about the sound of your avatar's movement?
21. How many types of sound could you hear in the game?
22. What did you think about game perspective and camera movement?
23. Did you choose first- or third-person perspective? Why?
24. What do you think about this game? What factors helped you to play well? How did you learn to play this game?

Not all players were asked all questions. Which questions were asked of a player depended on the characteristics of his or her play; for example, all questions were suitable for players who were deeply immersed in the game world (see figure 6-4).

Figure 6-4 the sample of workshop interview with the quest 'Aid for the wounded'

The results of the interviews with fifteen players are shown Appendix A; the interviews were transcribed and analysed according to the gameplay factors in table 6-4 (to be discussed in stage 1) thus yielding twenty perceptual factors.

Open questions allowed players to express their personal experiences; unanticipated responses contributed significantly to the formulation of the perceptual factors (figure 6-1). One example from the above interview is that the player had wanted to

interrupt his task to shoot a rabbit; he was unable to do so because it was not a game target. This researcher was surprised because the rabbit is irrelevant to the game; the lesson from this is that the players want to be able to do more than play the game – they want it to be more like real life. The words or phrases in table 6-4 show the summaries of each player's experience during the game workshop; however, some factors have more words or phrases and they also have similar terms because of sharing properties such as Realism and Movement; players feel the game is realistic when they can move around inside the game along the z-axis.

Words and phrases derived from player interviews are shown in table 6-5. These words and phrases are grouped according to the most appropriate analytical factors in table 6-6, thus illustrating how each factor is represented in each player's experience during gameplay. The factors represent the manifestations of visual perception in World of Warcraft: how players perceive the game. The right-hand column shows the number of players who shared similar perceptions. The twenty factors of gameplay analysis are the modes of the analysis of player experience.

The twenty factors of gameplay can be combined into four groups of modes of player experience:

(a) **Visual interpretation of the visual elements** refers to incentives to play, obstacles to play, gamescape and environment, game objects, colour and lighting, three-dimensional space, direction, sound and type of sound.
(b) **Gameplay** or **interaction** consists of the modes of movement, space of play, character interactions (between avatar and NPCs), the next action and perspective and camera movement.
(c) **Meaning Making** applies to ideas about the modes of avatar and its selection and the matters of realism.
(d) **Visual experience** refers to modes of feeling and emotion about the game, visual memory, experience and learning.

Many factors (analysis modes) can be classified under more than one category because they are connected through visual elements; for example the mode of direction can be places under both the Visual interpretation and interaction categories. The interview results provide the fundamental concepts for analysis of gameplay and player experience; the results are the raw material to enable development of the multimodal framework for analysis of player perceptions. The twenty factors derive from both the site of the game and the site of the player: therefore, constructing the visual grammar for online games requires integration of the two sites.

Table 6-5 Analysis of game workshop data

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
1	Emotion	experience, technique	myth	depressed, unclear	play more	confused	disappointed	joyful, impressed	impressed	disliked	play more	enjoy	liked moderately	play more	impressed	impressed
2	Encouragement	objects, journey	interaction, PvP	characters, skill levels	skill levels	avatar, skills	graphics	design, social	story, territory		quest	continuity, colour		opponent, scores	storyline	storyline
3	Obstacles	quest, camera	quest	unclear quest	quest		quest, unclear map	pop-up menu, quest	characters, avatar names	repetitive activities	language	objects, searching	game controlling	game controlling	perspective, camera controls	quest

			Players														
No.	**Analytical Factors**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
4	Avatar	Ideas	toy	represents player	represents player		represents player	represents player	characteristics		characteristics	represents player	characteristics	toy	represents player		
		Selection		cute	power	strength	ability	ability	beautiful	active	magic	strength	beautiful		realistic	new	beautiful
5	Gamescape			comfortable, viewable	unrealistic	large space	related to avatar	encouraged to play, no immersion	free world	beautiful graphics	realistic, surrealistic	another world	fun, chaos	storyline & sets	beautiful, well designed	themes fit characters	well designed

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
6	Realism	character movement	NPCs, avatars	avatars die, sounds	unrealistic	NPC interactions	unrealistic, immersion in fights	unrealistic	characters, sound		3D	unrealistic, imaginative			unrealistic, oversized objects	unreal
8	Colour/Light	encouragement realistic		realistic	single colour overused		creates theme design	over-bright colours hurt eyes	single colour unattractive	depressing dark colours	single colour overused	beautiful colours	unrealistic, over bright	encouraged play	suitable for characters	suitable for characters
9	Visual Memory	interaction		avatar image	giant monster		quest	collecting objects		forest	big fire, war themes	colours	opening scenes	caves, spiders	races of avatar	Elfs & Dwarfs

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
10	Movement	realistic	smooth	immersion during fighting	realistic	realistic	NPCs hard to locate	smooth		unrealistic	realistic	realistic	rough movement	confusing movement	natural movement	natural movement
11	Space		avatar centre screen		distracted by gamescape			gamescape too small, boring						beautiful, natural	big space	fine space
12	3D Space	big maps	realistic	walk in 3D, realistic						immersion on entering		fun space		big maps	immersion	3D movement

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
13	Direction	instinct, quest, visual clues	minimap, website	paths, minimap	minimap		minimap	quest, instinct, guess	map, visual clues	map, visual clues	map, arrow	map, paths	map	map, arrow, guess	map, visual clues	map, observation
14	Experience	discovery	graphics, decoration	controlling	travelling	Initially unattractive, then want to play more	confusing, repetitive	addictive		Initially disliked, then want to play more	exciting, want to play more	initially confusing	confusing controls	initially scary & confusing, fun later	impressive visually	learning controls
15	NPCs	clothes & accessories, skills	look interesting	unrealistic movement	bodies & clothes indicate performance	realistic	well designed fashionable	prefer to slay monsters	unrealistic		realistic movement	realistic, no immersion	realistic interaction	realistic, felt powerful	act like humans	

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
16	Next Action	storyline, visual clues			instinct			quest, instinct				quest		instinct, quest	quest, visual clues	quest, ask other players
17	Sound	attractive, helps at fight climax		creates realism		creates enjoyment		Noise, disturbance		atmosphere	creates enjoyment		wallpaper sound		immersion and special effects	natural sounds
18	Types of Sound	gun, monsters, attacking	ambience, footsteps, NPCs	animals, action	running, killing, monsters	NPCs, fighting, songs	monsters, fighting skills	atmosphere, special effects		special effects, monsters	special effects, swords	battles, selection commands		talking, special effects	monsters, special effects	monsters, music

		Players														
No.	**Analytical Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
19	Perspective	3PP– wider, 1PP – not smooth	3PP – good looking	3PP – wider & feels safe	3PP – looks clear	3PP creates direction	3PP – wider and good control	3PP – clear & appropriate		3PP – wider and controllable	3PP – safe	3PP	3PP - controllable	3PP – wider	3PP – can see round avatar	3PP – can see round avatar
20	Learning Experience	object usage, participation		too serious	emotional	graphics encourage play	aesthetic experience from graphics	fun and relaxing	fun and relaxing	fun and relaxing	fun and relaxing	fun and relaxing	fun and relaxing	fun & safe play	story keeps game rolling	visual expereince

Table 6-6 Visual-perception factors

Analytical Factors		**Player Perception**			**Player Numbers**	
1	**Emotion**	i	New experiences, new techniques	Like	**1**	13
		ii	Myth like watching television		1	
		iii	Wants to play more, know more about the game		3	
		iv	Difficult, confusing		2	
		v	Fun, enjoyable		4	
		vi	Beautiful graphics		3	
		vii	Ornamental gamescape, full of detail		1	
		viii	Collecting skills, seeking objects		1	
		ix	Console games have better graphics and controls than World of Warcraft		1	
		x	Opening, story, mythological characters, power recovery, graphics and big map		1	
		xi	Fantasy which seems real; design		1	
		xii	Depressed whilst controlling avatar; quests and how to make objects unclear	Dislike	2	2
		xiii	Repeated action, killing monsters, collecting skills		1	
2	**Encouragement**	i	Quest; weapons, surveying and searching		2	
		ii	Interaction (player v. player)		1	
		iii	Characters, skills; quests encouraged but difficult quests not encouraged		1	
		iv	Playing up to skill level; new features		1	
		v	Avatar ability and appearance		1	

Table 6-6 Visual-perception factors

Analytical Factors		**Player Perception**		**Player Numbers**
		vi	Graphics	1
		vii	Object design, objects available, beautiful gamescape, social networking and object trading	2
		viii	Story with new maps	3
		ix	Discouraging graphics	1
		x	Never ending game; colours encourage continued play	1
		xi	Opponents, accumulating points, points, power and skills; death and reincarnation; images and sound	1
		xii	Gamescape design	1
3	**Obstacles**	i	Camera controls in Third-Person Perspective	2
		ii	Quest unclear	6
		iii	Avatar controls	1
		iv	Player does not want to follow quest	1
		v	Quest systems, repeating quests and interaction, unclear map directions	1
		vi	Pop-up warnings	1
		vii	Limited choice of Avatar names	1
		viii	Boring with repetitive actions	1
		ix	Language (play is in English only; no Thai version during game workshop)	1
		x	Players cannot find quest objects	2
		xi	Controls	1
		xii	Camera reacts slowly to controls	1
4	**Choice of Avartar**	i	The avatar is a toy; the avatar “is not mine”; player does not feel inside the game	6
		ii	The avatar “is mine”, Night Elf selected for cuteness, smartness and power	4

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception		Player Numbers
		iii	Chosen for power and resistance to death	1
		iv	Blood Elf because it looks strong and fast	1
		v	Avatar chosen for skill and potential	1
		vi	Warlock for ability and potential; avatar is “my representative”	2
		vii	Night Elf: beautiful and can be decorated	1
		viii	Night Elf: active, fast and has a pet	1
		ix	Chosen for skill in magic and female – the avatar “does not represent me”	1
		x	Chosen for strength and female; I feel that I cannot breathe when I cannot breathe when it dives in water	1
		xi	Blood Elf for beauty and clothes	1
		xii	Worgen “to try out a new one; interesting story with transformation to werewolf	1
		xiii	Blood Elf because its beautiful and male: “It represents me”	1
5	**Gamescape/ Environment**	i	Feels comfortable; easy to see	1
		ii	Feels unrealistic because of rough ground texture but realistic because of avatar design	1
		iii	Enormous space to move in	1
		iv	Chose the race of his avatar to match the gamescape	1
		v	Gamescape corresponds to race of avatar encouraging play but not immersion	1
		vi	Free world (independent of the real world)	1
		vii	Beautiful graphics for players to enjoy	2
		viii	It is realistic, over realistic (surreal) making it depressing and difficult to breathe	1
		ix	It is like being on another star and in a forest	1
		x	Fun and chaotic	1
		xi	The graphics do not encourage play; the focus is on the story, sound and set which make	1

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception			Player Numbers	
			it realistic			
		xii	Many floors and confusing map; quest gives details which are not on the map		1	
		xiii	Design theme matches the character		1	
		xiv	Good environmental design except for the geometrical shape of the tree; design does not influence gameplay but interface and controls do		1	
6	Realism	i	Movement of NPCs and avatars	Realistic	1	6
		ii	NPCs and avatars create a feeling of reality		1	
		iii	Avatars can die; characters can act independently		1	
		iv	Interaction of NPCs give feeling of realism		1	
		v	Realistic; player immersion through characters, sounds images, etc.		1	
		vi	Realistic because it's three-dimensional		1	
		vii	Unrealistic because colours are too bright and textures too rough	Unrealistic	1	6
		viii	Unrealistic; feeling of immersion on during battles		1	
		ix	Not realistic but avatar selection helps create a feeling of immersion		1	
		x	Unrealistic: it's an imaginary world		1	
		xi	Unrealistic compared with other games; objects are oversized including buildings – relative sizes of objects are an important in creating feeling of realism		1	
		xii	Unrealistic gamescape; exists only in the game and does not represent the real world		1	
7	Game Objects	i	Beautiful, enormous objects with beautiful colours encourage playing	Realistic	1	6
		ii	Realistic but gets confusing when you can walk through a fence		1	

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception			Player Numbers	
		iii	Realistic; the tiger is realistic; other objects are realistic only in relation to my avatar		1	
		iv	Good composition but confusing map		1	
		v	Realism is fine; objects encourage play; big ones scare me		1	
		vi	Sound makes NPCs realistic		1	
		vii	Feels unrealistic	Unrealistic	1	3
		viii	Walking through objects makes it feel unrealistic; no responses or reactions from NPCs		1	
		ix	Avatars are objects, not players' representatives; Trees are represented by unrealistic geometrical shapes; shapes of objects influence play for better or worse		1	
8	**Colour and Light**	i	Colour themes for avatars	Beneficial	1	10
		ii	Colour creates feeling of realism		1	
		iii	Colour creates the environment so that players can enjoy it but interaction spoils this feeling (contrasting visual elements)		1	
		iv	Dark colours are depressing		1	
		v	Over use of colour does not affect play		1	
		vi	Beautiful colours but trees and monsters are the same colour		1	
		vii	Over use of bright colours creates the feeling of a unrealistic, toy-like place		1	
		viii	Colour encourages play and desire to win		1	
		ix	Colour themes fit with the characters.		2	
		x	Too much use of a single colour in the gamescape; it hurts the eye	Interferes	2	4

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception		Player Numbers
		xi	Colour helps create atmosphere, for example during battles; dark tones reduce clarity and hurt the eyes	1
		xii	Use of a single colour such as the dark tones of the Night Elf theme is unattractive	1
9	**Visual Memory** (the first thing players remembered after the game)	i	Interaction	1
		ii	Avatar and avatar's race	3
		iii	Giant monsters, ghosts	1
		iv	The quest dominates	1
		v	Collecting objects	1
		vi	Forest	1
		vii	The big fire and the war theme of the opening scene	1
		viii	The colours	1
		ix	The opening scene and the gameplay	1
		x	The cave and the spider in it	1
10	**Movement**	i	Feelings of a realistic world; animals and pets create continuity	2
		ii	Steady and continuous movement is realistic and natural	1
		iii	Feeling of immersion when the player is in a battle	1
		iv	Repetitive movement is boring; moving objects are realistic; swimming and diving are like real life	1
		v	Good composition of sets and props creates a feeling of movement; NPCs hard to locate	1
		vi	Unrealistic movement; reincarnation should be automatic	1
		vii	Attention to detail in design creates realism	1
		viii	Rough movement and unnatural responses are unrealistic	1

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception		Player Numbers
		ix	Feels disorientated by movement, direction and rotation of the camera	1
		x	Smooth movement makes the game flow and creates feeling of immersion	1
11	**Space of Play**	i	The gamescape has a good composition with the avatar set in the centre of the screen	1
		ii	"I am disturbed by the gamescape".	1
		iii	The area of the gamescape is too small and "makes us feel bored"	1
		iv	It is a beautiful, natural world	1
		v	It has a big space to support movement in the game	1
		vi	It is a big space; the amount of forest is just right, neither too much not too little	1
12	**Three-Dimensional Space**	i	A big map; most objects are grouped together	1
		ii	A realistic landscape like the real world	1
		iii	Walking in a z-dimension makes it feel like a real space	1
		iv	Immersion makes you feel you are entering the game	1
		v	A three-dimensional space is more fun	1
		vi	A three-dimensional space creates a feeling of immersion	1
		vii	Does not feel like immersion; a big space is appropriate for movement	1
13	**Direction**	i	Get direction by instinct or guessing	5
		ii	From quest information	3
		iii	Visual clue blinking or following a monster	3
		iv	Guided by minimap	14
		v	From information on the game website although the graphics do not indicate direction	4
		vi	Guided by pathways and marks on the ground	4
		vii	Arrows on minimap	2
		viii	Quest maps do not give location	1

Table 6-6 Visual-perception factors

Analytical Factors		**Player Perception**		**Player Numbers**
14	**Playing Experience** (before and after the workshop)	i	I want to discover more	1
		ii	Get impressions through graphics, fancy clothing and accessories and developing skills	1
		iii	Learning to control	1
		iv	Travelling in the gamescape	1
		v	Unattractive at first playing but later wanted to try more	1
		vi	Got confused with avatar settings and controlling it; boring because of repetitive tasks	1
		vii	Addicted to the game after playing to kill	1
		viii	Dislike the confusion initially but later became addicted	2
		ix	Had never played it before and got excited so I wanted to play more	1
		x	Controls confusing compared with a console game	1
		xi	Scary at first and kept confusing directions but later could kill and have fun and wanted to play more	1
		xii	Initially impressed with races and choices of avatar but later got the atmosphere from the sets, sound, story, colour, characters which together created a new visual language	1
		xiii	Learning to control my avatar and operate the game functions	1
15	**Other Characters/ NPCs**	i	Impressed with NPCs' clothes and accessories; NPCs and avatars are highly skilled	1
		ii	They look interesting; they help us not to feel bored; they have their own characteristics such as equipment, hair styles and voices	2
		iii	NPCs move unrealistically, like robots	1
		iv	NPCs bodies and clothes indicate their performance	1
		v	NPCs are realistic	2
		vi	NPC are well designed and fashionable but they are not clever because they just follow orders	1

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception		Player Numbers
		vii	The pets are not beautiful	1
		viii	NPC and avatars are unrealistic	1
		ix	They are real because they can move and make sounds; monsters and pets cry when they feel pain	2
		x	NPCs are game objects which decorate the game but interaction gives them a feeling if being real	1
		xi	My avatar was a female Night Elf; I felt I was her, felt powerful and was scared when she was scared	1
		xii	The characters act like humans	1
16	**Deciding on the next action**	i	It's in the game story through visual clues	1
		ii	By instinct	2
		iii	Players need and want to slay monsters	1
		iv	Through quest details, the environment and other components help the game to continue	4
		v	Instinct, guessing and quest details	3
		vi	Referring to the quest and asking other players	1
17	**Sound**	i	Attractive to players; songs help at the climax to a story such as fighting the boss	1
		ii	Sounds create a feeling of realism	1
		iii	Sounds create enjoyment	2
		iv	Sounds are noises which disturb play	1
		v	Sounds help create atmosphere in the game	2
		vi	Rarely hear sounds	1
		vii	Sound effects, such as the sound of monsters and sounds of attacking, give a feeling of immersion	1

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception			Player Numbers	
		viii	It simulates natural sound		1	
		ix	Sounds help with visual perception		1	
		x	Sounds, for example during a battle, are exciting		1	
18	**Types of Sound**	i	Guns shooting, monsters growing, monsters attacking, items opening and the sound of increasing ability levels		8	
		ii	Footsteps which differ according to surface		2	
		iii	Avatars' and NPCs' sounds		2	
		iv	Sounds of animals and actions and sound effects		2	
		v	Sounds indicating player/avatar has acquired new skill		2	
		vi	Music		1	
		vii	Atmospheric and background sounds		3	
		viii	Sounds accompanying magic		3	
		ix	Power charging and sword swinging		1	
		x	Talking and Clicking		3	
		xi	Rustling of leaves		1	
		xii	Soldiers sounds such as cutting		1	
19	**Perspective/ Camera Movement**	i	Not smooth	First-Person Perspective	1	
		ii	Gives a wide view	Third-Person Perspective	3	15
		iii	Can see space around; can see own avatar		2	
		iv	Can see direction ahead clearly		2	
		v	Separates player from game compared with first-person perspective but gives a broad view		1	

Table 6-6 Visual-perception factors

Analytical Factors		Player Perception			Player Numbers	
		vi	Clear and comfortable view		1	
		vii	Can see all around; keyboard controls are strange [when compared with a console]		1	
		viii	Feel safe behind		1	
		ix	The avatar is “not me”; I just control it		1	
		x	Avatar controlled from behind as in a console game		1	
		xi	Small buildings can obstruct the view		1	
		xii	Can see around and over avatars		1	
20	**Learning Experince**	i	Learning to play within a given time; learning to use weapons and meeting people			
		ii	Too Serious! Don’t want to try it again			
		iii	Fun! Relaxing! Serious emotional experience			
		iv	Graphics encourage play; I like it!			
		v	Gain new experiences from the graphics but I learnt nothing			
		vi	Learnt teenagers’ language			
		vii	Learnt about the game but did not learn how to improve skill levels			
		viii	Fun and relaxing			
		ix	New experiences			
		x	The game is fun; can play safely by staying at a distance from danger			
		xi	The game story keeps the game rolling			
		xii	Visual experiences and expecting experiences.			

Stage 3: Analysis of Gameplay to Define Interaction

The results of analysis of the gameplay workshop interview (stage 1) and gameplay videoclips (stages 1 and 2) demonstrate the connections between game storyline, quest, story plots and chronology of events, and visual interaction and player experience. Players create their own quest story through interaction with tasks; they interpret meanings through visual interpretation of the task. Players gain experience through interaction. The interactions are described as context of play situations in World of Warcraft.

Analytical Methodology to analyse gameplay interaction is adapted from three main concepts of Social Semiotics; these concepts are the three main components of Halliday's Systematic Function Theory; the four components of the Firth's Context of Situation; and Hyme's eight divisions of linguistic action. These three concepts can be applied to the context of situation of play in World of Warcraft. The quest story is composed of modes and sub-modes such as the game environment, game sets, props, game mechanics and rewards (see the stage 2). All modes are present in the field of gameplay. All these modes are relevant to the gameplay situation which we can call the '**Field of the Game Discourse**'; for example, the play situation of the quest 'Aid for the Wounded' is set in Coldridge Valley (see the stage 1); it is the battle between the Dwarfs and Rockjaw Goon. The modes of play are the interaction, Coldridge Valley including props and sets and players' rewards. The Field of the Game is the foundation of the analytical methodology because it categorises game components and elements and be used to construct the quest story from the gameplay (see stage 1).

Firth's Context of Situation is adapted so that **players in the game situation or setting** choose their own roles and their own status, avatars, class and race. This concept is the Tenor of Game Discourse borrowed from Halliday (chapter 4). The players interact with each other during the game whilst maintaining dialogues and interacting with each other outside the game. Sometimes two groups of players will join forces and play together; some players help each other and share their experiences of the gameplay, how to solve problems and to find appropriate ways to deal with tasks, etc. The player is one mode in the game situation or setting; the mode can be applied to the analytical framework to classify the role and status of the player, to be used later to analyse player experience. In the quest 'Aid for the Wounded', the player takes on the role of healer to help Dwarfs who are injured during fighting. Analysis of this component also takes players' conversations outside the game into account.

From the game workshop and subsequent interviews, interaction, between both player and game and player and player, is one component in the context of play situation. Interaction is determined by action in the game; interaction enunciates players' intentions; interaction allows players to control action; interaction permits players to share experiences; interaction enables players to gain experience; interaction fuels collaboration – these are the **Norms of Interaction** or the **Actions of Game Participants** (adapted from Firth**)**. The Norms of Interaction will be used

to analyse the gameplay interaction in this stage. Players can play in groups and share experiences of a shared quest. Players' successes can be shared in different ways. Sharing experiences on and advising how to perform a quest is standard practice; further advice, provided by fans of the game or players who have previously played the game, can be found in online media including websites and blogs. Not all players seek or follow advice; some prefer to make their own way. Norms of interaction will be used to establish the analytical framework.

Another component of the context of play situation which needs to be considered is the factors which influence player behavior. Several aspects of player behavior can be investigated under the **Modes of Game Action** (adapted from Firth**)** including:

- dialogue with NPCs
- dialogue between players
- written texts: chat log; game announcements
- quest: written instructions
- avatar gestures and posture
- player behavior: speech, gestures, facial expressions, posture
- player expectations: looking for a new map, anticipating a new skill level

In the context of situation of play, texts ('form of exchange': Halliday, see chapter 4) can be analysed through the three functions of metalanguage (Halliday, chapter 4). For this research, Halliday's three functions have been adapted as follows:

- experiential [**interaction**] meanings relate to transitive or linking actions between the real world and the game world.
- interpersonal [**player**] meanings includes player actions, feelings, emotions, judgments, expectations, etc.
- textual [**game**] meanings derive from design, themes, game story, game information, cohesive relations between interaction and visual design.

The mode of game action will be a component of the analytical methodology and used to analyse meanings and experience in the quest. In the quest 'Aid for the Wounded', players learn how to use quest items and how to control an avatar.

The following chart illustrates the fundamental components of the analytical methodology for gameplay analysis and their relationships (see figure 6-5).

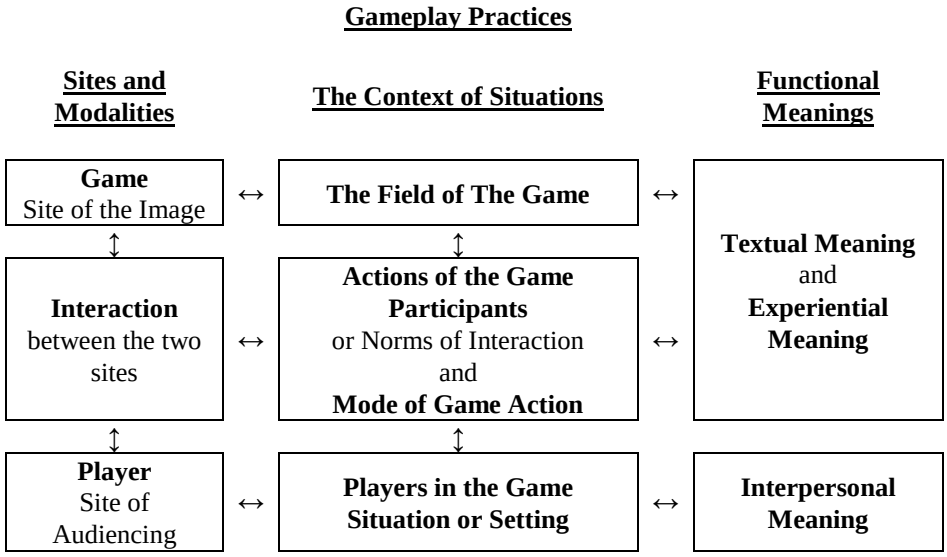

Figure 6-5 fundamental components of the multimodal framework

Players make meanings from the gameplay; the meanings are transmitted through modes; for example, one player in the quest 'Aid for the Wounded' was surprised to discover that he could shoot a rabbit – he showed his feelings through facial expressions and posture.

Interaction will be investigated through studying quest activities and the story plot of the quest; they are also required to study player experience. Rules of the game are regulated by game mechanics which can be studied gameplay and story structure. The investigation in this section will analyse player interaction; this will be performed through Game Mechanics, Game Activities and Symbolism, and Gameplay Interaction. The process will illustrated through one sample of gameplay from the stage 1: Player A.

(3.1) Investigating Game Mechanics through Gameplay

This stage concentrates on gameplay and its characteristics and how game mechanics functions. As mentioned early in the stage 1, the player's story is built upon a quest. Constructing the game story requires data from the gameplay: name of quest, quest category, quest details, rewards and quest givers (NPCs); that why we need to categorise and quantify the type of quest (stage 2). The quest is composed of a goal, tasks and action. An example of a quest story assembled from gameplay is shown in table 6-7; the gameplay of Player A will be analysed in this chapter. Table 6-7 expands the analysis of gameplay of Player A (plate 6-1) in the stage 1; the game story was reconstructed from the recorded gameplay and quests undertaken. The game story illustrates the gameplay. The quest table in table 6-7

lists quest details, game characters and gameplay story; it exemplifies interaction between player (i.e. avatar) and NPCs or creatures and game mechanics. Data are extracted and re-constructed from the gameplay analysis in the stage 1. The quest story is assembled from many plots; plots are the events in the game. The quest story also illustrates the workings of the game mechanics such as movement of avatars and NPCs. By extending data in the table, it can be demonstrated that the game mechanics tried to direct player A to go forward by providing the visual clues such as messages alerting him when completing quests, showing safe areas and quest targets and offering the player new quests.

Table 6-7 The quest story of Player A

Quest Details:	**Quest**: Aid for the Wounded (Sten's First-Aid Kit) **Quest Type:** Aid Quest **How Quest Items Were Used**: to heal wounded Coolridge Mountaineers; 15 seconds "cooldown" period before it can be used again. **After Aiding the Wounded**: return to Sten Stoutarm in Coldridge Valley **Completed Quest**: Many of those that y'saved have already made it back to camp; their wounds're well dressed! Ye might have a future in first aid, if ye're into that sort of thing!"
Characters	**Player**: Dwarf named Somemax **Pet** (helper): Bear **NPCs**: (1) Sten Stoutarm, dwarf – wears brown clothes and has no weapon: give quest to player's avatar (2) Coldridge Defenders, a male guards, two weapons; spear and gun (3) Joren Ironstack, a local mountaineer captain; wears green clothes (4) Wounded Coldridge Mountaineers, male and female, who wear green clothes **Monsters**: (1) Rockjaw Goon, skill level 2, has a body twice the size of other monsters (2) Rockjaw Invader, skill level 1 – its weapon is a bone hammer **Animals**: wild fox, white rabbit, wild pig
Gameplay Story	Gamplay starts with the player accepting a quest from NPC Sten Stoutarm; he accepts and Sten gives him eight items to help with the quest. He walks out of the camp with his bear helper and uses the navigator bar to find the quest target. The player shoots a monster to help a Coldridge Defender (trying out the quest); he loots an item from the dead monster. He tries to place the quest items on the NPC but is unable to do so. He tries another two times before deciding to search for other NPCs. He finds a new NPC, a Wounded Coldridge Mountaineer who is kneeling; he places the quest items on this NPC ; this time, it works! He runs to find more Wounded Coldridge Mountaineers looking like the first one. The second Wounded

	Coldridge Mountaineer that he encounters is being attacked by Rockjaw Goon; therefore, he shoots it and his bear runs to help. After killing the monster and healing the NPC, he stops to look at a jumping rabbit. He finishes healing another four NPCs; on the way back to camp he heals yet another NPC. A pop-up text informs him that he has completed the quest. He runs and jumps back to the camp.
Game System (Game Mechanics)	(a) Pop-up texts and signs inform player of completed quest and rewards (b) On completion of a quest, a new quest is offered automatically. (c) Safe areas for players and quest target zone are indicated.

The quest story in table 6-7 reveals interaction between the player and visual elements. Gameplay does not consist of a single quest but many quests a sequence of events which continue until the player stops playing. The game story illustrates not only interaction and other features of the game but is the setting for the elements of visual details: 'Game Discourse of Tenor' (adopted from Halliday). Analytical methodology in this stage is useful to investigate the gameplay in terms of activities and symbolism; these will be investigated in the next section. Game activities and symbolism will be used later to examine gameplay interaction and player experience. The next section will take the gameplay of Player A and analyse it further.

(3.2) Investigating Game Activities and Symbolism (Visual Design)

In the gameplay analysis of the stage 1, the main storyline is the creation of game designers. Within each game, players co-create the story. The game story is told through gameplay during the quest. The game story can be used to analyse story plots at micro level. Plot investigation offers new insights (see stage 1). If scholars extract quest stories from gameplay they will find patterns in the story revealing different types of plot. Plot types derive from dramatic narratives such as 'tragedy' (Aristotle, translated by Butcher, 1907) 'dramatic structure of Freytag's pyramid (Freytag and MacEwan, 1900) and Hero's journey modeled by Campbell (1968). The game story provides us with the pattern of interaction such as types of action and places visited. To investigate game activities (by extension of the analysis of stage 1) and the visual design, I will further analyse Player A's gameplay (plate 6-3).

By extending analysis of the game content or game story in World of Warcraft (quest data from www.youtube.com/watch), quest data can be broken down into various game activities. These activities represent interaction or visual activities. Visual activities demonstrate players' interaction with objects. Interaction can be analysed as follows:

Quest Subject: Aid for the Wounded

Breakdown of the quest:

1. Quest – The Call to Adventure – offered to player by NPC Sten Stoutarm
2. Player accepts quest – Acceptance of the Call
3. Walks from camp to battlefield – Crossing the First Threshold (image 1- 3 of plate 6-3)
4. Kills creatures and gains items (image 4 of plate 6-3)
5. Trial and error with quest items; picks wrong NPC (image 5 - 7 of plate 6-3)
6. Finds new NPC and heals him (image 10 of plate 6-3)
7. Successfully heals NPC (image 10 of plate 6-3)
8. Healed two more NPCs
9. Killed monster to help NPC (image 12-14 of plate 6-3)
10. Healing completed; returns to camp
11. During return journey, heals one more NPC (image 15 of plate 6-3)
12. Learns to jump
13. Returns completed quest and quest items to Sten Stoutarm; gains rewards.

Plate 6-3 The gameplay strip of the quest 'Aid for the Wounded' (extend from plate 6-1)

Figure 6-6 WoW landscape in Aid for the wounded quest

To analyse the quest story, it quest is broken down into small components, its story plots. Each story plot represents a small event in game interaction; therefore, story plots connect interaction to the game story and game practices. The sequence of story plots, which might be called 'game action' or 'interaction, can be used to analyse experiences. Table 6-8 identifies interaction in the quest 'Aid for the Wounded', expanding the content of table 6-7. These interactions also depend on visual elements; see figure 6-6.

Table 6-8 The analysis of contents and game activities from 'Aid for the wounded'

Interaction with the Virtual World		– Healing NPC – Accepting Quest – Taking quest items – Paying respect by bowing head – Stopping to observe a rabbit jumping – Player always uses running mode – When placing cursor over monster, cursor changes shape to sword
Visual Design	Environment (Visual Graphics)	– Valley is covered in snow with a little dead grass showing through – Valley has tall, green pine trees covered in light snow – Light wind is waving grass
	Game Objects	– Dwarf camp, wooden carts, boxes, big beer tank, lamp – Small lamp tower
	Colour	– Main colours are white and green representing winter in the north
	Sound	– Shooting – Sounds of Monster – Footsteps in the snow – Spearing monsters – Song – Sound effects: healing competed, quest completed, etc. – Bears growl – NPCs speak
	Other Observations	– When shooting, a line of light hits the targeted monster – When a monster is shot, cut or speared, it bleeds – When the bear scratches monster, red scratches are visible

The results in table 6-8 show the interconnections between the events of the quest and visual activities through symbolism such as how sounds change when the avatar performs different actions such as shooting or looting. Sounds of activities also change to match visual design; the avatar's footsteps produce different sounds on different kinds of surface. Another example of interconnection between visual activities and visual elements is shown in figure 6-6; visual activities of gunfire from NPCs and players are matched with the light of bullet from gun to monster; a splash of red on the shows where it has been hit. The sound of bullets and of the bear (avatar's pet) are also present. Table 6-8 demonstrates that interactions during gameplay connect modes of visual design including environment, game objects, colour, sound and visual responses. Another aspect of content relating to visual activities is characters both avatars and NPCs. Races and classes in World of

Warcraft are distinguishable because of their figures, gestures and language (also present in the gameplay of other players). Their languages are recognizable through their gestures and song themes; for example, Blood Elfs speak Elf. Characteristics of race and class are also evident in posture, clothes, props and sets. Buildings are attractively decorated with bright, warm colours to represent powerful magic and eternal life. Characters dress in the style of a thousand years ago. The songs of all races describe a fantastical, magical space; however, these interactions do not examine player experience or how they link up or influence player emotionally; this will be examined in the next section.

(3.3) Investigating Player Interaction and Experience

The two previous analyses of game mechanics and game activities investigated the links between the game story, players' activities and visual elements. This section will analyse further how these three modes relate to the player experience.

Events in Player A's 'Aid for the wounded' are listed below (extended from stage 1). These events not only tell what happened during gameplay but they match the player's reactions with what is happening in the game.

The quest story is broken down into events:

Event 1: Sten Stoutarm puts out a 'Call to Adventure'. ----------> Open Action
Event 2: The player accepts the quest and is given a useful item. ------> Lower-level Action
Event 3: The player walks from the camp to the battlefield (00:00:08). --> Lower-level Action
Event 4: He sees an NPC shooting a monster. He shoots a monster (00:00:33).
Event 5: He tries out one of his quest items on the NPC but it does not work.
Event 6: He finds another NPC who is kneeling and applies the quest item.
Event 7: He succeeds in healing her indicating that she is his target, a Wounded Coldridge Mountaineer (00:01:23).
Event 8: He finds another two NPCs and heals them.
Event 9: He kills a monster (Rockjaw Goon) with help from his bear (00:01:40).
Event 10: He watches a rabbit jumping.
Event 11: He heals a fourth NPC and who tells him that he has completed his quest.
Event 12: He goes back to the camp to report.
Event 13: Along the way back, he heals another NPC (00:02:05).
Event 14: He learns how to jump while running.
Event 15: He returns the quest. ----------> Closed Action

Higher-level Action

Norris's concept of multimodal interaction is applied to investigate events in the gameplay. The gameplay starts with the NPC offering the player a quest; this event is an 'open action' of player interaction; the player returning the quest is a 'closed action'. Norris's 'open action' means 'opening a conversation'; his 'closed action' means 'terminating the conversation'. The author of this research applied these terms to mean 'accepting a quest' and 'returning the quest.' Each quest, therefore, commences with an open action and terminates with a closed action. The mode gameplay interaction can be classified according to two divisions: higher-level

action and lower-level action. Lower-level actions are single actions such as players' facial expressions and head movements; likewise, likewise, avatars' walking, jumping, running, shooting, accepting quests, looting, etc. are lower-level actions. Players can simplify lower-level actions with macro key demands (short cuts through combinations of commands); they are often used during interaction. Players need learn how to use these shortcuts if they want to play fast and skillfully; the shortcuts apply not only to the game story, but also link with visual elements. Higher-level action is a multiplicity of chained, lower-level actions (Norris, 2004); in this study, it describes a sequence of interactions (events) occurring during play in the virtual and real worlds. These events are ordered; they create chains of action (adopted from Firth's and Hymes's concepts). This gameplay analysis shows only interaction between virtual and real worlds; the next section will analyse interaction between players in the real world.

Analysis of the video recording of player A whilst playing the quest 'Aid for the Wounded' is demonstrated in the plate 6-4 and table 6-9. The video was analysed by opening the two video clips together; the video clip of gameplay (virtual world) and the video clip of the player (real world) were played simultaneously; the results were extracted by observing the actions and reactions of the player whilst playing. Plate 10 illustrates gameplay during the quest 'Aid for the Wounded'; screenshots are interspersed with photographs the player showing his gestures. In the visual story, the dwarf explores a valley and gains experience. He learns shooting and face-to-face fighting skills from creatures. The screenshots show that the player always chooses third-person perspective providing a broad view of the landscape in front of his avatar; he can see a long way ahead. The eleventh shot in the sequence clearly shows the player's facial expression; this is the moment at which the monster jumps up, fills the screen and lands on top of him. The video strip shows that the physical modes of the player are directly connected to the virtual modes.

The table 6-8 shows players' gestures during gameplay alongside situated play. Conversation was concurrent during gameplay to share knowledge of this game and digital games in general. This phenomenon shows that players will help each other not only in the virtual world but also in the real world. Virtual world interaction such as dialogues between players and NPCs help players not to feel alone in the game space. Conversations create context of situation of play. NPCs' dialogue is repetitive; it encourages the player to keep playing. The table 6-8 demonstrates that players always share ideas with other players; they exchange experiences and may discuss problems and solutions.

Plate 6-4 Gameplay of the quest 'Aids the Wounded' in WoW

The table 6-8 demonstrates how players responded to gameplay through gesture, posture, smiling, laughter and head movement (lower-level interaction). NPCs' conversation offers companionship and helps the player not to feel alone; it is repetitive but helps to keep the player's attention and keep playing. During post-workshop interviews, players said that NPC conversations were a factor in making the game realistic. The table illustrates the overlap of interaction in the rear world with interaction between real and virtual worlds. Player 2 tries to raise questions about the game with Player 1, and to set higher-level actions, but fails because they are both concentrating on their gameplay; this showed through gestures and facial expressions (lower-level action). The players do not even pause; conversation overlays gameplay.

The conversation between two players (A and B) can be interpreted through Norris's concept as follows (translated from Thai into English):

Player B: *While still looking at the screen*: What's your level now?
---> *Open Action*

Player A: A*nswers while playing; his eyes do not leave the screen*:
I've only got level 2. I was frightened of killing the rabbit. I've just tried it. Now I'm playing continuously to collect more skill-level points. **------> *Lower-level Action***

Player B: Have you played any other online games? Umm, other online games? I can't count Death Frontier because I haven't played it for two years. It's very easy. **---> *Closed Action***

Higher-level Action

Table 6-9 The analysis of player interaction and experiences from 'Aid for the Wounded'

Interactions of and between players in the real world		– The player lowers his head to show that he understands what has happened in the gameplay. – The player shows he is frightened when he tries to shoot a rabbit for the first time. – The player smiles and laughs when he finds he can shoot the rabbit dead – The player shares experiences with a neighbouring player and talks to him about this and other online games. He suggests that the other player change his camera perspective to first-person.
Conversation	Real World (player)	Player_B: (while still looking at the screen) What is your level now? Player_A: (answers while playing; his eyes do not leave the screen) I only got level 2. I was frightened of killing the rabbit. I've just tried it. Now I'm playing continuously to collect more skill-level points. Player_B: : Have you played any other online games? Umm, other online games? I can't count Death Frontier because I haven't played it for two years. It's very easy.
	Virtual World (avatar)	NPC: What can I do for you? Greet to meet you! How r Ya? Welcome. Hello Quest completed. NPC: Yer a lifesaver! For Ironforge. What's on your mind? Safe travel!

Analysis of the conversation between the two players demonstrates that the interaction in the real world is higher-level action combining various modes of communication including movement, speech, gestures, facial expressions, posture, etc. Players use these modes to communicate with each other in- and outside the game; individually, these modes are lower-level actions. Higher-level action is a series of connected lower-level actions which form a 'chain of activities'. 'Chain of activities' describes players' game practices including in the real world. The previously mentioned sequence of plots in 'Aid for the Wounded' is a series of lower-level actions which form a chain of action. Chains of action can be in- or outside the game. Gameplay is a chain of interactions in initiated by the player. Modes of communication operate differently in the real and virtual worlds; for example, proximity of players is defined by social norms which do not apply to the proximity of avatars.

Interaction between real and virtual worlds or via the virtual world requires devices: mouse, keyboard, etc.; in particular, microphones and headphones are important for direct interaction between players avoiding the virtual world. Some players use a special keyboard and vibrating mouse for special effects, for example whilst shooting. Some new game devices such as Xbox and Wii employ motion-capture techniques; players can interact with and control game objects through body movement; this is not yet available for World of Warcraft; online investigation suggests that mouse and keyboard remain the primary input devices.

Topics discussed by players during the game workshop and in subsequent interviews can be classified as follows:

(a) fundamental aspects of the game and techniques of play
(b) consultations on gameplay problems and suggestions
(c) sharing new techniques
(d) sharing experiences of gameplay

Analysis reveals that there are various types of interaction in the quest 'Aid for the Wounded' both in the real world and between the real and virtual worlds. In this study, the player interactions are classified into three types. The three types of interaction are manifested as follows:

(i) Interaction between player and game environment: a player shoots a rabbit, loots a monster's corpse, accepts a quest or operates the navigation controls.
(ii) Interaction between player and player or players in the real world: the player could, for example, converse with other players in a game café or internet.
(iii) Interaction between player and player via the virtual world: a game may be set as Player versus Player (PVP) but this is not permitted in 'Aid for the Wounded' which is designed for solo play. At higher skill levels, World of Warcraft automatically resets itself to PvP.

The three action modes of interaction define high-level actions in the context of play situation. Lower-level actions are the modes of higher-level actions such as proxemics, posture, gestures and facial expression. Modes in the real world are classified independently of modes in the virtual world.

To sum up, the gameplay interaction relates to player experiences and their emotional reactions during gameplay. When players interact with game objects, they respond in a variety of modes including gestures, shouting, talking to themselves and talking to other players. The modes are expressions of emotion in situated gameplay. An 'Interaction' can be defined as a 'pairs of actions': action and reaction; the action is always in the real world but the reaction may be in either the virtual world or the real world.

In the previous analyses of the four stages, the research tried to develop an analytical methodology to investigate gameplay in order to be able to answer the following research questions:

- How do players interact with the virtual world?
- How do players interact with each other?
- How do players conceive and construct stories as co-authors?
- How can we study player perception?
- How is player perception related to game modalities?

The last two questions are unclear and cannot be answered satisfactorily; player experience needs to be investigated in greater depth. The next section will focus on how players learn during gameplay.

Stage 4: Analysing Game Literacies

'Audience' is a component of Buckingham's Game Literacy; 'Audience encompasses experience and pleasure of playing derived from rules and structures (chapter 2)'. 'Audience' broadens the investigation; additionally, this research will be further extended by incorporating other frameworks.

In this study, 'game literacy' means 'a learning experience in which players learn by playing and develop their playing skills to solve quest problems. Francis studies the 'pedagogical value' of the designed experience (the experience which the player gains through the design of the game) of a player in the game 'Revolution'; he concludes that:

… this pedagogical value depends on how this experience is used as a resource in various follow-up activities that encourage critical reflection of four features:

1. Learners develop an intuitive understanding of their character's place within a social field

2. Students develop a holistic understanding of the social system modeled through multiple modes of representation

3. Learning about the game world is a by-product of a personalized quest

4. Tentative hypotheses are generated through an iterative problem-solving process

(Francis 2011:95-97 – this quotation contains only the paragraph headings)

Francis emphasizes gameplay and quest experience. Analysis of game literacies must focus on:

- how they learn game skills and use them to solve problems
- how they learn to manage a group of players
- how they develop critical thinking

Francis is leading towards the most important question; Prensky, in his book 'Digital Game-Based Learning (2007)' asks "How do they learn what?" He notes that game-based learning requires a variety of content including information/facts, tasks, processes and skills. He also deals with the ways people learn which he adopts from medical school practice: how to perform procedures (physical skills), learning to diagnose (process, judgment and reason), etc.

Another supplement concept is James Paul Gee's idea of 'Digital Game Literacy' which concerns 'Semiotic Domains' and 'Self-Directed Learning' (Gee, 2003a). 'Semiotic Domain' refers to 'any set of practices that includes one or more modalities (e.g., oral or written language, images, equations, symbols, sounds, gestures, graphics, artifacts, etc.) to communicate distinctive types of meanings (Gee 2003:18)' (see chapters 2 and 4). Players make meanings from the gameplay; the meanings are transmitted through modes; for example, one player in the quest 'Aid for the Wounded' was surprised to discover that he could shoot a rabbit – he showed his feelings through facial expressions and posture.

Francis's, Prensky's and Gee's concepts about game literacies can complement Buckingham's in World of Warcraft to analyse learning of game skills, training skills, player interaction, camera perspective, and problem solving and critical thinking skills. Initially, players learn by trial and error which later develops into a decision-making process based on clues and more careful play; learning to use quest items is an example of this process.

Analysing game literacies in WoW from Player A's gamplay (continued from Stage 3)

The game literacy investigation and analysis derives from the workshop and interview. The quest 'Aid for the Wounded' was chosen; some analysis has already been carried out in the stage 1, 2, and 3; game items were analysed in the stage 1 and 2 and avatar movement in 3. Kinds of game object determine player practices, for example how and when to use them. Players have to learn how to use some quest items; the game provides training. Player A in 'Aid for the Wounded' practices using a quest item, Sten's First-Aid Kit to heal Wounded Coldlridge Mountaineers (NPCs) (see stage 3, table 6-7).

The quest 'Aid for the Wounded' is designed to teach players to heal NPCs who have been attacked by creatures. In the game workshop, only Player A chose to play this quest. As the gameplay starts, Player A learns by trial and error; he (his male avatar) discovers a new territory in the quest. The player prefers to use third person perspective from a high angle; when interviewed, the player said that this perspective and angle created a safe zone around his avatar. The player performs the basic game practices of his avatar, race and class (table 6-10) including shooting, angling, fighting with an axe, and controlling his avatar's movement, and direction using the navigation bar. The player collects items from one NPC, his quest give; he loots monsters' corpses.

Table 6-10 Analysis of player experiences from 'Aid for the wounded'

Game Literacies	Game Practices	– shooting the monster – using quest item to heal NPCs – learning how to run and jump – fighting with an axe – learning to use navigator bar
	Skill and Training	– first-aid kit – healing NPCs
	Items Collected and Looted	– collected from quest giver (NPC): first-aid kit, points and copper (money) – looted from monsters' corpses: copper (money)
	Movement	– walking, running, jumping, etc.
	Perspective	– third-person perspective at a high angle to place avatar in the centre of the screen
	Trial and Error	– tries twice to use quest item (first-aid kit) to incorrect NPC but gets it right at the following attempt; he can do it much faster for the remaining NPCs – killing monsters

Player A learns various game modes, and learns from practice-based playing (trial and error) through interaction with processes and procedures. This stage brings together and combines previous stages whilst analysis and meaning making – the learning process is being diagnosed. The player firstly interprets the quest; he has to heal NPCs. When he finds the NPCs being attacked by a monster, he instinctively shoots the monster; he discovers later that this is not a requirement of the quest – the way he performs is meaning making in response to visual interpretation. No rewards derive from killing the monsters, only loot. Analytically, this step shows the player's ignorance; it is not his job to protect the NPCs. It illustrated the psychological result of visual perception and how it affects his learning, reasoning and judgment.

Another skill which players learn how to operate avatars; movements of avatars include walking, running, jumping, diving, swimming, riding animals like horses,

driving machines like tanks, and flying an aeroplane, or dragon. New players usually learn basic skills for races and classes of avatar.

This researcher proposes six categories of game literacy based on Francis's, Prensky's and Gee's concepts derived from the analysis of Player A's experience from the quest 'Aid for the Wounded' (table 6-10):

- game practices – activities during the quest; interaction between the player and game objects.
- skills and training – different skills have to be learnt for each race and class of avatar including healing, fishing mining, casting spells, etc.; some skills can be discovered by players themselves – for example, the author discovered how to jump and turn around in the air whilst running.
- collecting and using task items – the way that player collect quest items from NPCs or by looting from a corpse.
- avatar movements – how to control the avatar
- camera perspectives – framing and camera angle; players can switch between first- and third-person perspectives during the game. (discussed in chapter 5).
- trial and error – the way in which a player can respond to a new problem or task, and how players make decisions; for example, misunderstanding a task or finding that something does not work and trying other ways to it.

These six categories will be useful to analyse player experience in three-dimensional online games. These categories were developed from analysing WoW; they will need to be adapted according to the characteristic gameplay of other games. The next stage will be to bring together all results from the four stages to investigate the interconnections between modes and modalities in WoW.

Stage 5: Examining Interconnections between Modalities of Game Components

Interconnection between modalities is mentioned by several scholars. Martinec noted the cohesion between various forms of systemic-functional linguistics and semiotics. Halliday divided metafunctions into three types of resource: ideational, interpersonal and textural. Cohesion is a component of and links textual resources; in addition, the process of cohesion is an ideational resource. This cohesion links all textual resources in a semiotic system (Martinec 2000, 243). In the first four stages, we investigated and developed ways to analyse each modality of the World of Warcraft game. These analyses provided not only characteristic modes but shows the connections between phases and how the modes influence each other. Modes are connected by interpretation of meanings:

game story	→	**visual elements**	→	**interaction**
(meaning X)		(meaning X)		(meaning X)

Meaning is the most important aspect of the ways modes are connected.

According to the analases in the previous four stages, online digital game is a complex network of sites and modalities. The player interacts with visual elements in the game and draws on quest stories within the game's interactive storytelling (described in stages 1 and 2). The interactive story is not the game story but is the gameplay narrative. A game storyline, created by game story writer, aims to tell the story and lay down what happens in the game. The game storyline represents the whole framework for building quests. The game story unfolds through two main channels: animation and written texts. The game designer can use animation to connect stories, for example from different times or space. As the game story progresses, designers use quests to connect game territories thereby bypassing time and space. Storylines can be broken down into quests; quests are interactive stories. Quests contain interactive story plots created by the gameplay. Players playing the same quest create different quest stories; each player will play the game differently, for example by visiting different locations, interacting differently and making different choices. Quests are extensions of the main storyline; they unfold events and reveal the landscape; gathering quests enable players to familiarise themselves with the landscape; several players chose to start with gathering quests. Events and interaction make up story plots; they are how players interact with objects; game objects are visual forms which complement the story line. Visual design is a component of visual narrative. Only players can create the sequence or flow of stories; the stories are non-linear and dynamic. Visual elements exist to illustrate the storyline. Players "edit" and thereby co-create quest stories.

Sound is considered an interaction mode. Sound is a component of the theme of the game story. Sound connects visual design to gamescape. Songs and background music are different in each territory. Some sounds, such as shooting or footsteps, are connected to interaction; furthermore, sounds of footsteps are related to the nature of the ground; footsteps sound different on snow compared with grass (Player A).

Visual forms determine the way players interact with the game; players interact with a visual object in a particular way. Fire burns so players move away. Different classes and races of avatar jump in different ways. Visual form determines interaction; to cross water, avatars can only dive or swim. Particular types of game object lead to particular types of interaction. Players cannot pass hostile creatures unharmed. To increase health levels, avatars must sit whilst eating and drinking.

In the plate 6-4, player plays by interacting with visual elements; player displays emotion through posture, gestures, facial expression, shouting, talking to oneself and hitting the keys hard, etc. The game and players' emotions are, therefore, connected through interaction. Players may also gesture that they have learnt or experienced something new, for example by nodding or talking to themselves to signal understanding.

Some gameplay modes may, sometimes, not connected to other modes. Adjacently seated players in the physical world are able to communicate with each other through, for example, gestures and speech. Gestures and speech may not be coordinated; during a conversation between two players, the two players are

communicating with each other through their speech; they continue to look at the screen during the conversation but their gestures relate to action on screen. Delayed responses may be observed in the conversation due to concentration on the game. Table 6-8 illustrates the disconnection between conversation and gestures. Gameplay is dominant and conversation subordinate. The phenomenon was noted by Theo van Leeuwen: '… communication acts which identify the stages of 'performed' genres may or may not include speech (van Leeuwen 1999; 2004)'.

Investigation of interconnections between players and game world

The analytical methodology has developed into five stages. Each phase has its own analytical function. The analysis of each stage determines the classification of modes of gameplay and interconnections between them. The five stages of the Analytical Methodology in World of Warcraft are laid out in Table 6-11.

Dourish (2004) describes the connection between the two worlds thus:
In a conventional immersive reality system, the user is user is projected into a virtual space by means of datagloves and sensor mechanisms. At the very same time as the VR system exploits a user's familiarity with three dimensions, gravity and other features of reality that have been adapted to the virtual, it removes the user from the real physical world. The physical space and the virtual space exist in parallel, knowing nothing about each other. In hybrid spaces, by contrast, there is no such projection; instead, the physical and virtual are combined, each becoming aspects of the other. (2004:150)

In summary, the different types of interaction are interconnected in multiplayer online digital game. Interaction connects through meaning; game stories link with quest stories; quest stories connect gameplay or interaction (between player and visual objects) via game practices or avatar action); avatar action links to visual objects and simultaneously links to players' gestures and body movements. Some modes of connection might fail if meaning is misunderstood, causing a break down in visual communication; the player may need to reinterpret the meaning. The player of the quest 'Aid for the wounded', for example, initially makes a mistake in his interpretation of the quest; he has to reinterpret it to put the quest back on the right track.

Online digital game analysis is not linear; rather, it is cyclical in that some stages may require the reexamination earlier phases which may then need to be amended. Gamescapes are designed in accordance with theme of the game and main storyline and adapted to the requirements of the quest. Sub-components of one stage are associated with sub-components of other stages. This analytical methodology requires data from both physical and virtual space.

Table 6-11 Interconnections between modes of player and game through analytical methodology

Stage 1 Conceptualisation of the game concept, features and gameplay	– Gather game information – Define game design theme – Define gameplay – Define game features and interfaces – Record gameplay in virtual space and game interaction in the real world – Define modes of gameplay
Stage 2 Categorisation and quantification of modes of game components and elements	– Categorise and quantify the mode of characteristic gameplay in WoW – Categorise and quantify the type of quest – Categorise and quantify the analytical factors of player perception
Stage 3 Analysing gameplay to define interaction (3.1) Investigating game mechanics from gameplay (3.2) Investigating game activities and symbolism (visual design) (3.3) Investigating player interaction and experience	– Investigate game mechanics from gameplay by reconstructing game mechanics – Investigate game activities and symbolism (visual design) – Investigate player interaction and experience
	– Identify main storyline, quests and story-plot structures – Analyse interactions between real and virtual worlds – Analyse modes of visual elements – Analyse visual principles
	– Analyse player-to-player interactions – Analyse player participation and how players influence each other – Analyse experiences – Analyse emotions
Stage 4 Analysis of game literacies	– Analyse how players learn – Analyse how players acquire skills – Analyse how players frame and choose camera perspectives
Stage 5 Examining interconnections between modalities of game components	– Analyse relationships between modes of storyline and quests; and quests and story-plots – Analyse relationships between modes of story-plots and visual elements; and visual elements and sound – Analyse relationships between modes of visual elements and virtual interactions – Analyse relationships between modes of visual elements and emotions; and interactions and emotions – Analyse relationships between modes of visual elements and experiences

The Analytical Methodology for Online Digital Games is summarized in figure 37. The five stages need to be performed in order; no stage can be omitted. It might be necessary, however, to return to an earlier stage to perform it afresh in the light of subsequently garnered data and later analyses. For practical reasons, each stage of the analysis has to be carried out in order, although with some iteration; however, the analyst must identify interaction between modes across all stages irrespective of the order in which they have been performed.

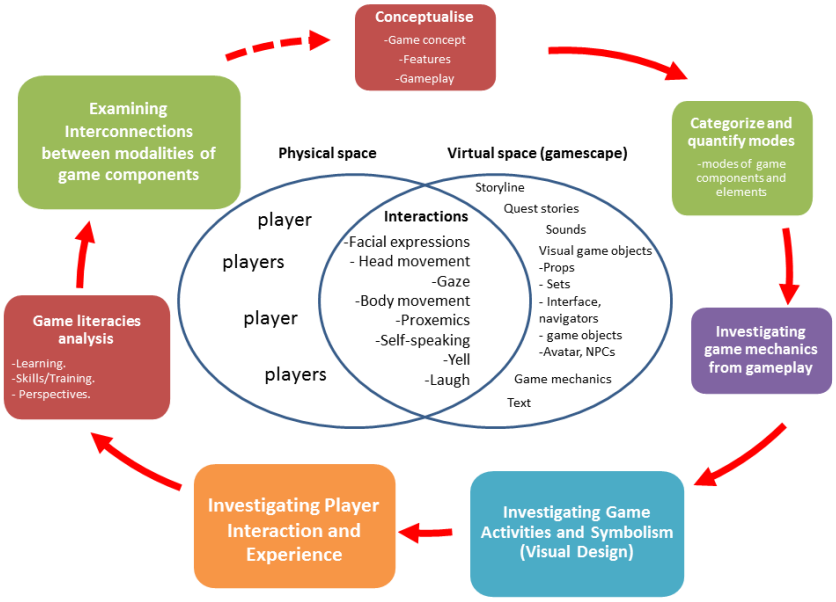

Figure 6-7 Analytical methodology for analysing player perceptions in online games

Discussion

It is claimed that online digital games are complex systems because of their multiple modes; the modes accomodate accumulated and transformed meanings in the cycle of reproduction and consumption (van Leeuwen and Jewitt 2010). This chapter has established an Analytical methodology to compile a Visual Grammar of Player Experiences and Perceptions for World of Warcraft. The analytical methodology is the product of the visual language employed by game designers to create their virtual worlds; it can also be used to interpret gameplay through player perception.

It is the intention of the author to apply his Analytical methodology to digital games and interactive media. Some aspects of the framework may need to be revised in the light of further data and experience gained.

The last chapter will bring together the visual-semiotic concepts from chapter 5 and analytical methodology from chapter 6 to write the Visual Grammar; the Grammar

will integrate the site of the game image and the site of the player and interaction between them.

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CHAPTER 7. INTEGRATING PLAYER PERCEPTIONS INTO VISUAL GRAMMAR OF ONLINE GAMES

The main objective of this study is to investigate the relationships between game content and visual design in digital games which afford players experiences. The research connects two sites; the site of the game image and the site of the player. Chapter 5 investigated Visual Grammar in the Site of the Game through visual semiotics and art theory; it provides compositional interpretation through content analysis. Chapter 6 studied the site of the player by interpreting player experiences through gameplay and interactions.

In chapters 5 and 6, it was shown that visual principles and visual operators controlled and connected visual elements. Players interpret to make sense and make meanings when they interact with objects; they also create the game story. Interaction describes the ways players interact with the game world; interaction couples the real and virtual worlds. This chapter describes interconnections between the two worlds: how distinctive modes in each world are linked; it shows that the interconnection between objects in the two worlds supports the establishment of a visual grammar. This chapter also provides further evidence that visual grammar forms meanings; it examines how these meanings are perceived.

7.1 Integrating two distinctive frameworks: Visual Grammar and Player Perception

The game storyline is the starting point for framing a Visual Grammar for World of Warcraft. The storyline provides the framework and ideas for game designers. Inspired by the storyline, a single design theme unites game components: quests, gamescapes, characters, colours, objects, background music and sound effects. The design theme and its components are governed by the Visual Grammar. The contribution of this research towards framing a Visual Grammar is shown in table 7-1 – The integrated Visual Grammar Framework; it illustrates how the Visual Grammar is composed of the Site of the Game and the Site of the Player; how they interact and how Elements, Principles and Operators are organised. Table 7-1 also shows how the three distinctive analytical approaches are applied to the Sites of the Game and Player and interaction.

In World of Warcraft, players are provided with quests; tasks are performed whilst journeying in a virtual world. The game story is composed of the players' own game plots within the provided main story; gameplay is the progress of the game. Quests are built on gamescapes; gamescapes are integral to quests. Storylines

operate to a theme derived from mythology, fantasy, adventure, science fiction and so on; a theme dictates the design of all visual elements, including sound, within a quest. A quest must be completed before the next can be undertaken; some quests are extensions of previous quests. During gathering quests, players collect objects necessary for the quests which follow. Journey quests allow payers to explore and familiarise themselves geography and activities in the gamescapes. Storyline, quest and visual design are closely integrated at both micro and macro levels (see chapter 5).

The Site of the Player is also integrated into the framework. Players connect to the game world through interaction with visual objects; they share interaction with other players in the same territory. Players choose quests and perform tasks; thus, the game story begins. Each player has a different game story since they choose which objects to interact with. Through interaction, players read the visual design and interpret visual meanings to be able to decide how to interact or respond, enabling the continuity of action.

Interaction gives players experiences which form their perceptions. Some quests do not make the story progress but players accumulate experiences and gain experience. Experience of play derives from the quest story and visual interactions. Table 7-1 integrates two concepts of the integrated Visual Grammar Framework:

1. Visual Grammar (chapter 5)
2. Multimodal Analytical Framework (chapter 6)

The integrated framework is constructed from the investigations conducted in chapters 5 and 6. It can be adapted and applied to investigate the visual grammar of other three-dimensional online games and even other genres; if this is done, the games would need to be well understood and some components modified. The framework is valuable for analysis of the Site of the Game and of interaction between game and player and between players. Visual semiotics and Art Theory can also be usefully applied to investigate the site of the Game, and Multimodal Analysis to the Site of the Player and interaction between game and player and between players. Application of Visual Grammar to other games requires redefinition of Visual Elements, Visual Principles and Visual Operators; it will then be able to be used to analyse game characteristics, game components, basic laws, visual interaction, mechanics and interactivity. The Site of the Player and interaction between player and game and between players are analysed through gameplay; this analysis enables scholars to understand players' perceptions from how the act, react and interpret the game.

Table 7-1 The integrated Visual Grammar Framework

<table>
<tr><th colspan="2">Visual Components</th><th colspan="2">Sites & Interaction</th><th colspan="2">Research Approaches</th></tr>
<tr><td colspan="2">Visual Elements</td><td>Game</td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td colspan="2">Visual Principles</td><td>Game</td></tr>
<tr><td rowspan="6">Visual Operators</td><td>1.Basic Laws of Visual Perception</td><td>Game</td><td>Interaction</td><td>Player</td><td>Multimodal Analysis</td><td rowspan="6">Visual Semiotics including Art Theory</td></tr>
<tr><td>2.Laws of Visual Grouping</td><td>Game</td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td>3.Composition Principles</td><td>Game</td></tr>
<tr><td>4.Principle of Visual Interaction</td><td>Game</td><td rowspan="2">Interaction</td><td rowspan="2">Player</td><td rowspan="2">Multimodal Analysis</td></tr>
<tr><td>5.Interactivity and Game Mechanics</td><td>Game</td></tr>
</table>

7.2 Interconnections between modalities in the virtual world and the real world

Players in the real world interact with game objects in the virtual world. Some players perform quest activities only with interactions relevant to the quest. Players interact directly with visual objects, thereby gaining experience and improving their skills, as illustrated in figure 7-1. Gameplay is a flow of interaction; gameplay establishes patterns of movement in the virtual world. Visual objects, gameplay and experience encourage players to interact; for example, tasks require players to interact with visual objects. Players and visual objects are linked through interaction and response. Analysis of interconnections of modalities of game elements in chapter 6 illustrated the relationships between modes of the site of the game and the site of the player. Analysis shows that modes are linked; the mode of players' gestures is linked to the mode of emotion and the mode of interaction which is linked to visual interaction, the task and game story. Integrating interaction (figure 7-1) into the analytical framework demonstrates that players interpret game meanings through visual design and interaction in which designers have incorporated meanings. Players decode meanings during gameplay; however, to interpret meanings players require basic knowledge of designers' principles. Some visual language from the real world can be applied to the virtual world.

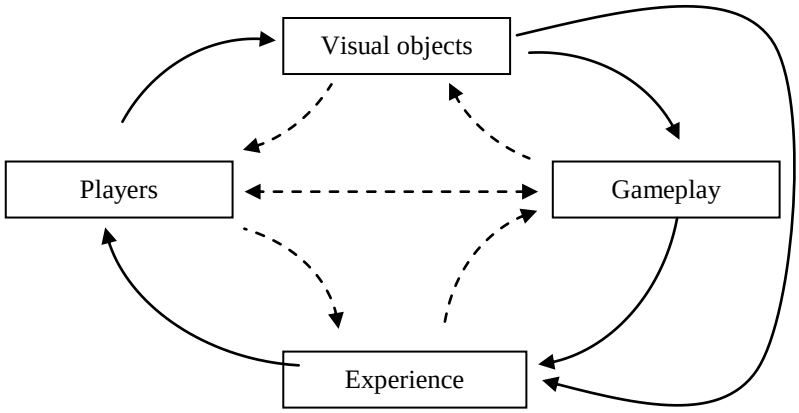

Figure 7-1 Diagram illustrating interaction between player and game

Figure 38 illustrates the how interaction between player and game takes place. Players are actors in the game; they interact with the game through visual objects; interaction is manifested through gameplay. Gameplay is also how players gain experience. Figure 38 illustrates the application of the integrated Visual Grammar of table 7-1 to analyse World of Warcraft. Table 7-1 shows the relationships between sites and visual components and incorporates the two main analytical approaches: Multimodal Analysis and Visual Semiotics which includes Art Theory. The two analytical approaches can be adapted and combined to analyse both game and gameplay in order understand players' perceptions. Figure 7-1 illustrates how the theoretical framework is applied.

7.3 Summary and discussion

The Visual Grammar of World of Warcraft is assembled from the analysis (in chapters 5 and 6) of the Site of the Player and the Site of the Image. Developing the analytical framework began with visual analysis in the game landscape by defining the position index using the two- and three-dimensional grid systems; it positions visual objects in the game landscape. Visual analysis in this research combines various methodologies with differing analytical frameworks; they are used to classify visual elements and establish visual operator principles and visual rules. The foundational methodologies and frameworks are art theories, visual semiotics and Gestalt theory (Metzger 2006)

The initial visual analysis of the game was restricted to samples drawn from a small number of quests in a few territories. This analysis did not sample all game objects and territories because of their large areas. Questions might be raised concerning the sample size; a small sample of images in the game landscape was sufficient to

define the primary elements. This sample enabled compilation of the Visual Grammar from extant theories plus additional components such as player perception. These findings could be used to further develop other components and complex concepts. Visual grammar is constructed from the designer's viewpoint, that is, his or her knowledge of how to construct the game.

The site of the player also focuses on interaction. Players are co-creators; they have the freedom to choose game objects and interact with them. During play, players draw on their own experience to interpret visual design; however, they must first learn the visual language of the game to learn meanings of visual designs and sounds because many objects do not exist in the real world. In order to decide how to react, players interpret meanings of visual objects. Sometimes interaction by the player is reflexive and unpremeditated.

Applying Visual grammar to Visual Design requires careful consideration; otherwise, it may affect players' perceptions to cause misinterpretation. A gamescape in a vivid single colour should impress players but may have the opposite effect and distract them when they play for longer periods; this is the case with some World of Warcraft territories. Jerky movement can, likewise, distract. Superimposition or overcrowding of animated objects is yet another example; it may be difficult to click on the right point. Visual elements may be camouflaged against the gamescape and hard to differentiate. These are examples of misapplication of the Visual Principles to the detriment of player perception.

During play, players have to interpret multiple texts, written, visual and sound through interaction. Visual interpretation can be erroneous, caused by the visual grammar itself, player experience or devices. Misinterpretation can arise from reasons such as:

(a) unbalanced visual design with for example, vivid colours or oversized objects.
(b) visual clues which do not provide enough detail or information: there is no prominent clue; the player cannot see the clue properly
(c) quest details are unclear, thus confusing the player
(d) an error in the program; the player cannot complete the quest
(e) objects arranged too densely and superimposed, causing problems of selection and slowing progress of the game

Players themselves may misinterpret grammar. Some players are able to pick up on visual clues but others not and must learn the grammar of the game in order to be able to play well. If a new rule of visual grammar is introduced during play, the player has to learn it; players must be familiar with the basic rules in order to maintain continuity. In this study, Multimodal Discourse Analysis investigates the site of the player by analyzing player experience and interconnections of modalities. Player experience is a factor in visual grammar according to the Basic Laws of Visual Perception mentioned in chapter 5.

The analytical framework for online digital games may be usefully applied to and other digital games or interactive media but adapted for physical and social interaction, mode of experience and nature of the game including audiences and devices (Buckingham (2010); this is the intention of the author of this study.

The primary limitation of this research is that it considers solo players and does not extend to group play; group play can be usefully studied in the future. Another topic for future consideration is visual design at the macro level; territories, geographical locations, positioning in the virtual world. Relationships between visual design and player, likewise, have not yet been studied in sufficient depth.

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APPENDICES

Appendix A. Example of an Interview (Player A)

1./2. How do you feel about game and why do you feel this way?

Player A: It opened my eyes and ears. It combines the best features of other games including the interface. The game provides new techniques for players; this is what I mean by 'opened my eyes and ears'. The imagery of the game didn't feel any different from other games. Other factors which 'opened my eyes and ears' were the choices of professions and races in comparison with other games which offer limited choices. [This game offered new experiences and techniques including race selection.]

3. What are the main factors or game objects that make you feel that way?

Player A: Surveying and searching persuaded me to continue playing. These techniques are part of the game quest; for example, I played a Dwarf and was given a quest to find alcohol tanks during which I had to search all areas on the map. It took a long time to find the last one but I finally located it near the camp; initially, I passed it and had to search again. I can confirm that the quest is one factor which keeps me playing; the object is difficult to find. Another persuasive factor is the weapon; this race [Dwarf] uses a gun which changes into a hand weapon which can hit a monster. There is another race which uses longbows. [Factors which encourage this player are surveying, searching, quest and weapon.]

4. What bores you in the game or interrupts your play?
Player A: The quest can be a problem if it's unclear I'm not patient enough. I might not continue to play if I have to search all over a huge map. Perspective is another problem because I can't watch my avatar closely at a low angle in first-person perspective so I have to choose third-person from a high viewpoint. Some quests are not clear and difficult to complete causing me to waste a lot of time. Another problem with this quest is that it lacks a purpose even after reading the details many times. [The quest and camera angles are problems.]

5. Why did you choose your character? How did you feel about your character during the game?

Player A: I used to play DotA ['Defence of the Ancients': an older, more static role-playing digital game with only high camera angles] and only selected races with guns; I liked it. My avatar is just a toy for me. I do not feel anything for my avatar, only myself. I am concerned with safe play which is why I like guns. [The player is not immersed in his avatar; for him, it is a toy.]

6./8. What do you think about the gamescape?

It's big and wide. The graphics should be improved to make it more realistic; for example, tree leaves are rectangular; geometric shapes are unrealistic but the avatar seems realistic. Fire makes a game more realistic; walking NPCs also make a game more realistic. [Fire and movement of NPCs make the game more realistic; conversely, geometrical shapes for natural objects make the game less realistic.]

7./9. Do you think that the game world is real or virtual? What factors or objects make you feel that way?

Player A: The helper (a bear) always follows me. The trees are appropriate and arranged in a good composition. The pet [bear] makes come alive but the trees have no bearing on the gameplay. Objects, apart from the pet, have no effect on making the gameplay better. If there is a pet in the game, it helps the story to continue. [Animals provide continuity.]

10. What did you think about colour in the game? How did you feel about it?

Player A: Green makes the gamescape more realistic as does light. [Realism derives from colour and light.]

11. What do you think about realistic game objects?
Player A: I don't think trees and snow in the game look real even if that's what we call them. The game tries to imitate realistically but it doesn't work; it looks like two pieces of paper wrapped up together. [Game objects are not realistic.]

12. What object dominates the game? Would you recognise it after you have finished playing?
Player A: I can shoot a rabbit which I think I couldn't have at the beginning of the game. I think it's a decorative object and shooting it should not be allowed. Shooting it makes me think there is a lot more to discover in the game. [Interaction with objects dominates the game.]

13. How do you feel when you move your avatar?
Player A: It feels natural. I feel I'm inside the gamescape especially while I'm searching for objects. [Movement by player/avatar simulates realism.]

14./15. What do think about moving in three dimensions in the game?
Player A: Compared with other online role-playing games, it [World of Warcraft] it's too broad [i.e. the gamescape is too big] and the monsters are crowded into particular areas. It's too uncomfortable. [The gamescape is too broad and crowded in particular areas.]

16. What do you think about direction in the game? How do you know the right direction? Which game object tells you the right direction?

Player A: I don't think it's a walk in the forest. [There are pathways through the forest to lead the character to the target.] It's artificial, an environment created for the game which tells us the game-story. I find my way through my own instincts. The game tells players what to do through blinking objects [visual clues] and quest details. I often guess the direction in the game. [The player relies on instinct, quest details and visual clues.]

17./20./21. How did your feelings about the game change during play?
Player A: When first playing this game, I chose a human avatar with a sword, but it was not safe enough; however, on the second time of playing, I discovered many new things. Sometimes sound is important but in this game it is necessary to tell the locations of objects. Some gamescapes are enhanced by sounds such as guns, monsters, monsters attacking, objects opening and increasing skill levels. I think there was a song but I paid no attention to it; the song accompanies the climax of the fight with boss. [The player wants to discover more. Sound creates emotions.]

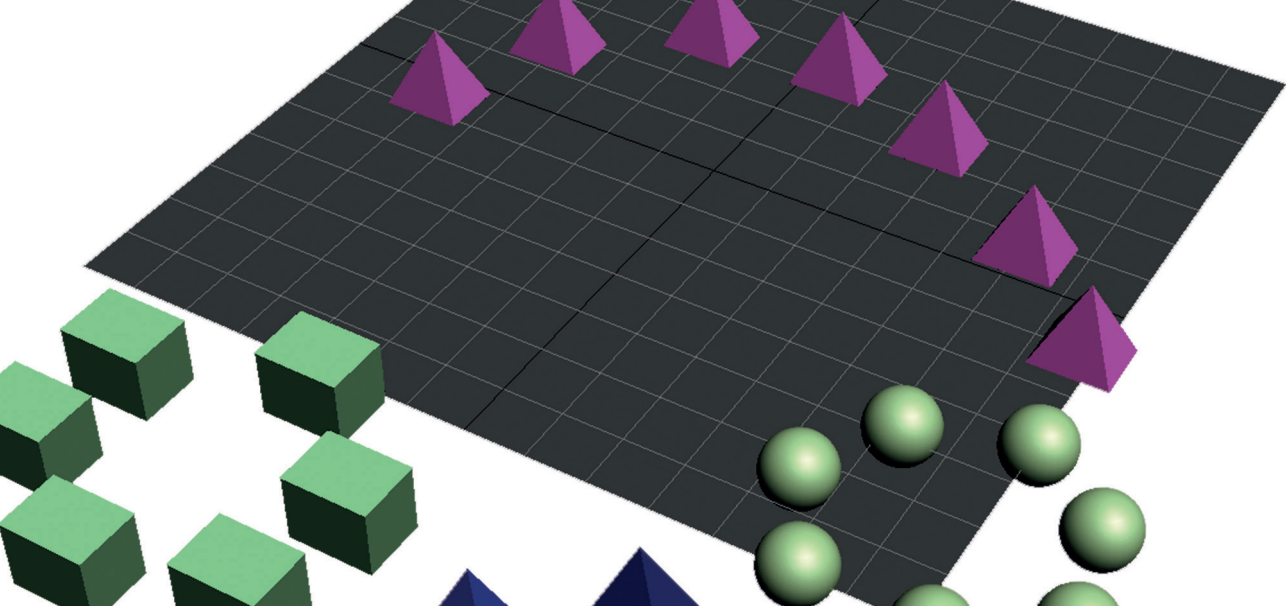
18. How did you feel about other characters' movements including monsters?
Player A: I was surprised to see other players' avatars dressed in fantastic costumes; how can I achieve the higher-level skills to do this? Some monsters had special skills that I was not ready for. I practised my shooting skills on distant monsters. [The player is impressed by decoration. He gained experience in defence skills.]

19. How did you know what your target was? How did you know what your next move was to be?
Player A: Target objects flash when you search for them during a quest. The game story guides you to the next target. [Location is established by game story and visual clues.]

20./23. What did you think about game perspective and camera movement?
Player A: I chose third-person perspective because it gives a wide gamescape. [Third-person perspective suits this player.]

24./22. What do you think about this game? What factors helped you to play well? How did you learn to play this game?

Player A: I didn't find the game much fun to begin with but if I play for longer, I will enjoy meeting more people. The best thing about the game was the weapon. The game taught me how to plan and helped me to be observant. [The player developed his observation skills and enjoyed using the weapon.]



SUMMARY

This study investigates the relationship between the visual design and player experience in the online game. This study focuses on the role of visual grammar in relation to player perception in World of Warcraft. The phrase 'visual grammar' in this study is a metaphor representing to 'the principles and rules of a visual game landscape (the game territory and environment) for composing the forms of visual elements and structuring the meaning of perceptual experience. It creates the system of visual communication in a particular context'. This study employs two approaches which combine analytical methods from different disciplines; they are visual approaches: visual semiotics and art theories to analyse the game, and multimodal discourse analysis to investigate the player experience and interaction. The units of this study emphasize on three area of investigation which are the site of game images, the site of player and interaction. This study carries on two main data which are the author gameplay experience and the gameplay workshop. The final results of this study are used to propose the fundamental visual grammar for analyzing three-dimensional online games. This fundamental structure of visual grammar consists of the initial units named visual elements which are regulated by the visual operators under the visual syntactic rules; the player experience is count as part of these rules.

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